The Information Experience of Going Mobile for Health and Wellness: A Grounded Theory Study

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Information experience, information research, everyday life information experience, mobile technologies, mobile device, mobile use, health and wellness, consumer health, qualitative research, constructivist grounded theory, library and information science (LIS).

Abstract

This study investigated a common yet little-understood phenomenon that supports the health and wellness of people in everyday life. These days most people use a smartphone which is a convenient and often engaging technology with ever-increasing functionality. Health consumers are becoming more involved in their personal health and wellness, and without a personal mobile device it is difficult for people to participate in everyday socio-economic activities that support health and wellness. Although many researchers and stakeholders worldwide recognise the importance of mobile use to consumer health, social inclusion and connection, few studies focus on understanding the everyday life information experience of consumers outside healthcare settings. This qualitative study addressed this gap by investigating the nature of people's everyday information experience in using mobile devices for health and wellness as expressed from their perspectives.

Focused on mobile device users aged 18 years or older who recently used their devices to be informed about health and wellness, I interviewed participants in single, semi-structured, in-person, in-depth interviews. Twelve participants conversed with me about how they use their mobile devices (such as smartphones, tablet computers and wearable technologies) for health and wellness in everyday life. Kathy Charmaz's constructivist grounded theory approach provided the methodological framework for this study. This approach sees participants as partners and assumes that findings offer an interpretive portrayal of the studied world rather than an exact picture.

The substantive grounded theory developed through this study titled *Going mobile for health and wellness* reflects the action-oriented nature of the phenomenon and the fact that participants make an active choice to use personal mobile devices for health and wellness. The theory consists of five categories that represent participants' collective experience of the phenomenon. The interconnected categories of experience are: *Knowing myself; Feeling connected*; *Facing uncertainty*; *Doing my own research*; and *Motivating myself*.

I aimed to develop a theory that is relevant and relatable to people in everyday life. This study is significant because it gives voice to everyday health consumers who use their mobile devices outside healthcare for their self-care. The findings present an unconventional yet faithful view of information as experienced by participants beyond the traditional notions of

information seeking and retrieval in Library and Information Science (LIS). This study contributes knowledge to the new and evolving information experience research domain. Findings provide practical insights into health consumers' information experience which can inform current practice in health programs and services.

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Statement of original authorship

The work contained in this thesis has not been previously submitted to meet requirements for an award at this or any other higher education institution. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made.

Signature: QUT Verified Signature

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Cottonwood Avenue, Colorado. September 2019.

Chapter 1: Introduction

1.1 INTRODUCTION

"Smartphones have the ability to engage the user and deliver high-quality content that is unrivalled by any other device in human history" (Pandey, Hasan, Dubey, & Sarangi, 2013, p. 138). The mobile device is a feature of daily life that has transformed the way people access and exchange information. Mobile devices are accessible to the masses yet customised to the individual for personal use. Many stakeholders worldwide recognise their importance to health consumers because they can (and have) improved the health of many people with "anytime, anywhere access" to healthcare services through sensor technology and social and self-care support (Anwar, Joshi, & Tan, 2015). As health consumers become more involved in their personal health and wellness, mobile devices are a port of call for many.

Constant Internet connectivity or being "permanently online" or "permanently connected" (Vorderer, Krömer, & Schneider, 2016, p. 694) is a norm for most mobile users and this promotes a culture of connectivity. Mobile technology provides immediate, seamless and constant connection to information as well as to family, friends and acquaintances (Choi, 2016; Ling et al., 2012 cited in Ling, 2014, p.176). Each additional channel that mobile devices afford provides people more opportunity to stay connected. However, the effects of mobile-mediated relationships on relationship quality and subjective wellbeing are not well understood (Chan, 2018).

In this introductory chapter, I provide background and context to the research study. I then discuss the research problem, research question, research method, key findings and contributions of the study along with a brief explanation of key terms. I conclude the chapter with an overview of this thesis.

1.2 BACKGROUND TO THE STUDY

Mobile devices such as smartphones and tablet computers provide access to much of what we now value and are "the last thing at night, the first thing in the morning" (Traxler, 2016, p. 8). They are powerful and portable tools that are ubiquitous and usually in close reach (Howard & Bussell, 2018; Burford & Park, 2014). According to a Deloitte (2017) study on global

mobile consumer trends, four decades after the introduction of the first mobile phone, almost every developed country surveyed has at least 90 per cent mobile phone penetration. The study observes that:

> Mobile devices are now a fixture of modern life. So much so, that people without access to mobile devices are severely limited in their ability to participate in the full spectrum of today's economic and societal activities.

Other researchers explicitly state that this access is critical to improving quality of life and wellbeing (Hong, Trimi, & Kim, 2016). In an increasingly complex information and consumer age, convenient and personalised information is in the hands of many. Mobile devices enable continuous communication and sharing yet are inherently personal devices. The availability of low-cost applications or "apps" (software programs designed to work on mobile devices) means each mobile device can be customised and accessorised to its owner's needs and whims for work and play.

A Pew Research Center survey (Fox & Duggan, 2012) indicates that using a mobile device for *health* information is a common and significant phenomenon. The survey found that 52 per cent of smartphone owners in the United States used their devices for health information. People are becoming more involved in their self-care. Self-directed searching online for health concerns is common and can inform individuals beyond the doctor's office (Manierre, 2015). Notably, searching for health information online for someone else is also common (Fox & Duggan, 2013). The perceived risk of a health threat motivates health information seeking (Myrick, Willoughby, & Verghese, 2016). In particular, being female and owning a smartphone or computer tablet is associated with online health information seeking (Myrick & Willoughby, 2017). Although there is a trend towards self-diagnosis with the assistance of online health information (Manierre, 2015), there is no consensus in the literature on whether health information from the Internet substitutes or complements healthcare (Suziedelyte, 2012). Moreover, access to online health information does not correlate with accurate use and evaluation of information (Rennis, McNamara, Seidel, & Shneyderman, 2015).

Self-tracking via mobile devices offers many possibilities. Mobile self-tracking technologies are suitable both for healthy people (preventive care) and for the ill (intervention) – in each case, "the technology assists in keeping a close watch on the condition" (Gabriels & Moerenhout, 2018, p. 2). The "quantified self" is an everyday health-focused movement that started in California. It entails the use of mobile technologies to track personal data for self-knowledge as well as sharing experiences online and offline (Lupton, 2016; Edwards, 2017).

Health-related apps provide a new means of gathering health information (that is, they are an alternative to traditional media), and these apps have a profound effect on personal health management (Cho, Lee, & Quinlan, 2015). Exercise, weight and diet apps are the most popular and 19 per cent of smartphone owners have one or more health apps (Fox & Duggan, 2012).

In most developed countries about nine per cent of the population own a fitness band (Deloitte, 2017). When I started this research study, wearable technology was a new kind of mobile device. I have witnessed wearable technology ("wearables") such as fitness bands and smart watches become popular in everyday life. I first learned about Fitbit, a brand of fitness band, in 2015. The idea of this research study started years before when I noticed that it was a common sight to see people of all ages engaged with their mobile phones. I was intrigued that they seemed so intrigued. I browsed the literature for smartphone studies on my first tablet computer in 2013.

1.3 THE RESEARCH PROBLEM AND THE RESEARCH QUESTION

Mobile devices "offer rich digital experiences on the go" and are "changing the way we experience and engage with everyday life" (Deloitte Access Economics, 2013, p. 51-52). Mobile devices enable new opportunities for health consumers to access information, track personal bio data and connect with each other on the go. The experiential perspective in this study focuses on such rich digital experiences in everyday life. In contrast to clinical health research that focuses on illness and interventions, this study focuses on consumer health and wellness in everyday life from participants' perspectives. At the start of this study in 2014, no information experience research existed on the phenomenon in this study. This remains the case in 2019. My study addresses the research gap by responding to the research question:

> What is the nature of people's information experience in using mobile devices for health and wellness?

Emanating from this question, the purpose of the study was to develop a theory that is relevant and relatable to people in everyday life. I did so by identifying what participants experienced as informing and what they did with the information in this previously unexplored context.

Information experience is both the research object (what the research investigates) and the research domain (the field or territory) of this study. Information experience is grounded in real life and is evolving both as a concept and a "vibrant" research domain (Bruce, Davis, Hughes, Partridge, & Stoodley, 2014b, p. 320). Partridge and Yates (2014, p. 19) describe it as "a new and dynamic field of information research".

Latham, Gorichanaz, and Narayan (2017, p. 3) observe that "information science has begun a turn toward aspects of human life beyond information needs, seeking, and use". Researchers have seen the value of focusing on people's experiences in research and practice because "attending to experience involves a change in how we look at the world" (Bruce, 2014, p. 15). I chose information experience as a research object and research domain because it is both dynamic *and* grounded in real life. I believe that seeing the value of focusing on what people experience as informing is integral to this turn in Library and Information Science (LIS). In contrast to the traditionally narrow focus on the definition and range of information, information experience offers a broad view of information as experienced by people in a certain context. This view does not "privilege" written text (Harlan, 2014, p. 102) or documentary forms of information (Lupton, 2014, p. 83).

Davis (2015, p. 134) states in her pioneering information experience thesis that her participants rarely used the word "information". Instead they used words like "advice" and "ideas", and it was her role as researcher to identify information experience from their narratives. Davis (2015) asserts that her study did not fit into the dominant discourses of information seeking, information use and information sharing. I concur that the information experience field invites a broader view of information and people's engagement with information. For example, reminiscent of Davis' (2015) findings, Haidn, Partridge, and Yates (2014, p. 17) refer to "ideals and values" as internal information that informed how a participant voted in their information experience study. The turn or movement in Library and Information Science (LIS) research includes the growing body of work that attends to various aspects of information experience whether it is explicitly referred to as information experience research or not. Information experience research builds on information literacy research with a relational perspective while at the same time offering its own distinct approach. This is discussed further in the preliminary literature review chapter. In the next section, I outline how I investigated participants' information experience in this study.

1.4 METHODOLOGY

Constructivist grounded theory is the overarching methodological framework in this study. I chose a qualitative method to address the research question because I aimed to interpret the *nature* of people's information experience. As a research object and research domain, information experience is relatively new and in a developing phase. No information experience theory exists in either the context of mobile use or health and wellness. Since little was known about the phenomenon, I chose a well-established methodology that suits exploratory research and does not require an existing model or framework. Rather, I developed new theory in accordance with constructivist grounded theory methodology. This version or perspective of grounded theory positions the researcher as the author of a reconstruction of experience and meaning (Mills, Bonner, & Francis, 2006b). In contrast, classic grounded theory sees the researcher as an objective observer.

Barney Glaser and Anselm Strauss, sociologists in the United States, published *The Discovery of Grounded Theory* in 1967 which outlined a method for the generation of theory from qualitative data. Grounded theory is a set of systematic principles for conducting research and analysing inductive data. The aim is discovery rather than verification. Data analysis is a process of open and focused coding that follows the principle of constant comparison which is a hallmark of grounded theory. This involves comparing data, codes and categories repeatedly throughout the study. Grounded theorists work from the data up to more abstract concepts to develop theory. "Grounded theory" is also the product of the research process – the product being the theory generated from data analysis.

Constructivist grounded theory developed about 30 years after the classic grounded theory of Glaser and Strauss. This version developed from the work of Kathy Charmaz who was a former student of Glaser and Strauss. I discuss the evolution and controversies of grounded theory in the research methodology chapter. Constructivism emphasises co-construction of meaning and knowledge by the researcher and participants.

Focused on mobile device users aged 18 years or older who recently used their devices to be informed about health and wellness, this study included a total of twelve participants (four from the pilot study and eight in the main study). I chose face-to-face interviews because of the interpersonal nature of this study in which I viewed my participants as people and partners, and also because of the sensitive nature of personal health and wellness. The scale of the study was limited in favour of depth and richness of qualitative data.

In accordance with constructivist grounded theory, data analysis and collection occurred concurrently, and coding was iterative. Charmaz (2006; 2014) provides systematic, yet flexible guidelines for collecting and analysing data which includes coding, memo writing, theoretical sampling and theoretical saturation. I also referred to the work of other grounded theorists and Saldaña's (2009) coding manual. I used a combination of coding methods in two main coding phases which Charmaz (2006; 2014) refers to as initial and focused coding. My primary coding method was gerund coding which entails the use of action verbs (ending with "ing"). For example, "sharing photos" and "seeing my fitness progress". Coding is the "pivotal link" between collecting data and developing a theory to explain these data (Charmaz, 2006, p. 46).

My frequent and significant codes contributed to tentative, conceptual categories. For example, because of the frequency of codes relating to self-awareness and personal preferences, "Knowing myself" was a logical tentative category which eventually became a category. Developing categories involved scrutinising codes and categories over a long period of time (from 2014 to 2019) using the constant comparison technique. This entailed verifying that the data supported the tentative categories until the categories were saturated.

Grounded theory findings offer "an interpretive portrayal of the studied world" rather than an exact picture and categories should cover a wide range of empirical observations (Charmaz, 2014, p. 17). Each of my categories includes many diverse properties or subcategories which I refer to as "aspects" because "properties" implies that they were waiting to be discovered rather than constructed. Interpretation and co-construction of theory in a researcher-participant partnership is integral to constructivist grounded theory.

1.5 KEY FINDINGS

The outcome of this study is the substantive grounded theory co-constructed with my participants titled *Going mobile for health and wellness*. The short title "*Going* mobile" reflects the fact that participants make an active choice to use mobiles for health and wellness. The theory consists of five categories which are an interpretive portrayal of the studied experience. The categories of experience discussed at length in Chapter 5 are: *Knowing myself; Feeling connected*; *Facing uncertainty*; *Doing my own research*; and *Motivating myself*.

Participants experience *Going mobile for health and wellness* as personal, purposeful and convenient. Evident across all five categories, these three key features are interrelated and

influence participants' information experience profoundly. The medium of the mobile device facilitates many facets of life including health and wellness via the same convenient platform. Hence, it is also conducive to the blurring of information, communication and entertainment which all play a part in the everyday experience in using mobile devices for health and wellness.

Many information interactions shape the overall information experience of *Going mobile for health and wellness*. From the categories, I developed two typologies which outline the *types* of information participants encounter and what participants *do* with information respectively. I refer to these typologies as the *Typology of information* and the *Typology of information actions*.

1.6 ORIGINAL CONTRIBUTION

This research study contributes to theory and practice as outlined below.

1.6.1 Contribution to knowledge

The research study presents the unique theory of *Going mobile for health and wellness* which provides understanding of the nature of using mobile devices for health and wellness. In so doing, this study makes three main contributions to knowledge. First, it provides understanding of information experience as experienced by a specific cohort in a specific context. Second, it enriches understanding of information experience as a broad research object which, in this study, presented an unconventional yet faithful view of information as experienced by participants beyond the traditional notion of information seeking and retrieval in Library and Information Science (LIS). Third, this study contributes to the discourse of information experience as a research domain. In particular, I suggest that a rethinking of what constitutes a context in the information experience domain is required. Participants literally carry their personal devices across the conventional contexts of education, work and community which makes it difficult to delineate clear boundaries in daily life.

The findings serve as a foundation for further related studies in Library and Information Science (LIS), consumer health and mobile device use. Currently, in 2019, the information experience domain remains sparsely populated in general and devoid of mobile use and health and wellness research in particular.

1.6.2 Contribution to practice

Both mobile use and self-care are activities of mass participation globally, so any insights into understanding and supporting people in their everyday health and wellness will benefit many. This study found what health consumers actually experience as informing from their perspectives. A better understanding of health consumers' information experience can inform current practice. This may benefit practitioners in many arenas who provide health and wellness support to consumers including health, health promotion, medicine, mobile health, libraries, government and independent agencies.

In Chapter 7, I outline how findings contribute to practice in two main areas: consumer health and library services. When designing health care programs and services, it is important to consider the information experience of individuals (as well as health status and demographics) in the consumer group. An experiential focus encouraged empathetic, nuanced understanding of what was important to participants. Many of the implications for practice in consumer health also translate to Library and Information Science (LIS) especially in medical, health and public libraries with health advocacy roles. Findings from this study have the potential to benefit Library and Information Science (LIS) professionals and library users.

1.7 EXPLANATION OF TERMS

This section lists key terms used in this thesis to establish clarity about my interpretation of concepts. These terms are neither universally understood nor defined in the literature.

1.7.1 Information

For the purposes of this study, information is broadly defined as anything that is experienced as informing (Bruce, 2008), and the nature and form of information is revealed in the ways that participants experience and assign meaning to it. I see information as context dependent. It is "a human construction and we construct our own reality from what we find" (Edwards, 2006, p. 25). In other words, people interpret what is informing to them and, in so doing, what constitutes information. In Chapter 6, I outline what participants experienced as informing as well as the main information types and information actions in this study.

1.7.2 Experience

Charmaz (2006, p. 46) states that "the empirical world does not appear to us in some natural state apart from human experience". In keeping with this understanding and the definition of information above, I see experience as a human construction. In this study, experience is also understood in the phenomenological traditions of lived experience articulated by Van Manen (1990). Sandberg (2005, p. 43) similarly states that "the human world is never a world in itself; it is always an experienced world". Essentially, I focus on how participants explain their lived experience of the phenomenon with particular attention to the meaning they construct and assign to information.

1.7.3 Information experience

Similar to the broad definition of "information", I define information experience as the way in which people experience or derive meaning when they engage with information in their everyday lives (Bruce et al., 2014a). Specifically, the participants in this study are the experiencers of information, so information was defined by how I interpreted their encounters or engagement with information.

In this study, I see information experience as a personal, subjective, mind-body experience that is the result of interaction with information. Participants' information experience involves information use, information literacy, information behaviour and information practice as well as contextual variables such as, mobile device use, biology (health history), biography (life history) and personal preferences. All of these variables shape the way information is experienced.

1.7.4 Health and wellness

I use the term "health and wellness" broadly. The participants initiated and co-constructed the meaning of health and wellness with me through the study. Health and wellness involve a complex interplay of variables and there are many ways to define and understand these concepts. Health refers to what the World Health Organisation describes as "a state of complete physical, mental and social wellbeing and not merely the absence of disease and infirmity" (1946, p. 1).

This study focuses on maintaining wellness and wellbeing rather than ill-health, infirmity, disease, disability and medicalisation. The World Health Organisation definition includes "wellbeing" and is a holistic alternative to Cartesian dualism in Western medicine, that is, the

view that mind and body are essentially separate entities. The focus on wellness did not exclude illness, disability and disease.

For the purposes of this study, consumer health refers to products and services intended for use by the general public. All participants are health consumers. Although I focused on everyday self-care rather than institutional healthcare, I did not exclude or overlook participants' experiences of hospitals, surgeons, general medical practitioners and other health professionals.

Participants considered an eclectic range of topics to constitute health and wellness such as fitness training, feeling good (physically and emotionally), rest and relaxation, mental health, nutritional health, alternative health and caring for relatives' wellbeing. The value they placed on social connection and amusement indicated that an everyday health and wellness context is quite different to the research contexts of healthcare, education or workplace.

1.7.5 Mobile device

A mobile device is defined as "a handheld computing device, such as a smartphone or a tablet" (Short & Uzochukwu, 2018, p. 194). Although this includes smartphones and tablet computers, the definition is not limited to these examples.

In this study, the most frequently discussed devices during interviews were smartphones, tablet computers and wearable technology. Participants also considered laptops and e-readers to be mobile devices which they used in daily life. However, they seldom talked about these in the context of health and wellness. Perusing research for the preliminary literature review revealed that the most frequently researched mobile devices at the time were mobile phones with more recent studies specifying smartphones. When writing the discussion and conclusion chapter four years later, I observed many new studies on self-tracking with wearable technology.

1.7.6 Mobile device user

Based on the definition of a mobile device above, a mobile device user refers to a person involved in any activity using their personal mobile device/s. There is no generic definition of the term "mobile device user". I left it to participants to define what they considered to be "use" on their mobile devices. In this study, examples of participants' mobile device use included (but was not limited to) tracking diet and fitness routines with fitness apps, fitness bands and smartwatches, navigating geographically, organising personal information, text

messaging, instant messaging, e-mailing, online searching, sharing photographs, watching videos, listening to music and podcasts as well as playing mind-stimulating games online such as Sudoku and Bridge to improve memory.

1.8 THESIS OVERVIEW

This thesis includes seven chapters. After this introduction chapter, I present the preliminary literature review in Chapter 2. In that chapter, I discuss the role of the literature review in grounded theory. I define the scope and position of this study by reviewing related research published prior to my confirmation of candidature seminar in late 2014. The preliminary literature review reveals the sizeable gap that this research addressed.

In Chapter 3, I outline the research methodology including a section on grounded theory origins and evolution as well as the rationale for using constructivist grounded theory. I then outline the research design and implementation which were informed by the pilot study. This outline includes a detailed account of data collection and data analysis. The chapter ends with a discussion on maintaining quality in this study and ethical considerations.

In Chapter 4, I introduce the twelve participants in individual profiles. In accordance with constructivist grounded theory which sees meaning and reality as co-constructed in a researcher-participant partnership, I also provide my profile.

I present the findings of this study in two chapters. In Chapter 5, I present the grounded theory of *Going mobile for health and wellness* developed through this study. In Chapter 6, I explore this substantive theory to provide further conceptual understanding of the nature of information experience in this study.

In Chapter 7, I summarise the study's main findings and compare *Going mobile for health and wellness* to relevant theory and research. I discuss the contributions of this research to existing knowledge and practice as well as the implications of the study for information experience. I detail the limitations of the research before suggesting future research directions and concluding the study.

1.9 CONCLUSION

In this introductory chapter, I have provided background and context to the research study. I outlined the research problem, research question, research method, key findings and contributions of the study along with a brief explanation of key terms and an overview of this

thesis. I have introduced information experience as the research object and research domain. In Chapter 2, I present a preliminary review of literature relevant to my information experience research in order to position the study.

Chapter 2: Preliminary literature review

2.1 INTRODUCTION

In this chapter, I present a preliminary review of literature relevant to this study. This entailed a critical analysis of literature published prior to my confirmation of candidature seminar in late 2014. By defining the scope of the study and mapping the research territories and their relationships, I reveal the large unexplored spaces left in the literature and the position of this study.

After this introduction, I provide a brief discussion on the role of the literature review in grounded theory. The subsequent sections in this chapter focus on the phenomenon which is the information experience in using mobile devices for health and wellness. First, I outline the origins and evolution of information experience as well as information experience research studies. Information experience is related to the experience-based relational perspective of information literacy. Both belong to the Library and Information Science (LIS) discipline. Second, I outline the three main theoretical approaches and three contexts of information literacy research. Third, I discuss the budding area of health information literacy which has recently focused on the experience of older people. Fourth, I outline the flourishing areas of consumer health information research and mobile use research. These broad areas are relevant because participants in this study are health consumers and mobile device users. These roles are integral to the context of their information experience. I conclude the chapter with a summary of the research gap.

The continual evolution and convergence of mobile technologies are evident in the literature. This review focuses on relatively new mobile device technologies such as smartphones and tablet computers that support Internet connectivity. Wilson (2006, p. 682) observes that because information science research has become “the lifeblood of society”, research has fragmented across a wide range of disciplines. In any case, it was necessary to include research beyond Library and Information Science (LIS) in my study. This review is primarily concerned with empirical research and conclusions are drawn from a critical analysis of the literature.

2.2 GROUNDED THEORY APPROACHES TO LITERATURE REVIEW

The role and the timing of the literature review in grounded theory are disputed. Glaser and Strauss' (1967) classic grounded theory asserts that grounded theorists should start research with an open mind and avoid preconceptions. Thus, their approach is to delay the literature review until theory is developed. While Charmaz (2006, p. 165) posits that it is impossible for a researcher to suspend knowledge and experience, her stance is also to delay the literature review because this "encourages you to articulate your ideas" rather than the views of previous studies.

The research design of this study does not include the suspension of the literature review because the arguments *against* delaying the literature review were more compelling. I acknowledge that while the arguments for a delayed literature review are valid, they were not practical in this situation. The doctoral program required a literature review early in the study. The question of credibility is particularly significant for novice grounded theorists. How can the researcher know if their study is original or unique? How can a research gap be identified without a literature review? Not being aware of related research undermines research strategy and credibility. This outweighed the risk of exposure to ideas from a preliminary literature review.

Intrinsic to grounded theory method is that theory is grounded in data. Grounded theorists do not start with hypotheses, rather they work from the data up to more abstract concepts to construct theory. Their theory is developed from data analysis rather than from previous research. Therefore, after completion of the preliminary literature review, I did not return to information theory literature until after my theory was developed (four years later). Essentially, this was a compromise or balanced approach between the tenets of grounded theory and the requirements of the doctoral program.

2.3 INFORMATION EXPERIENCE

In this study, information experience is both the research object and the research domain. In this section, I trace the origins and evolution of information experience as a research domain as well as a research object. Information experience as an object of study is defined as the way in which people experience or derive meaning when they engage with information in their everyday lives (Bruce, Davis, Hughes, Partridge, & Stoodley, 2014a). I discuss the

handful of published studies with information experience as the research object. The borders (or rather, frontiers) of information experience as a research domain are not entirely defined which I also explore in this section.

2.3.1 Origins and evolution of information experience

Originating from researchers in Australia, information experience research is related to information literacy research. "While the idea of information experience was present in the earliest work [that is, information literacy research with a relational perspective], it has not been until relatively recently an explicit focus" (Bruce, Davis, Hughes, Partridge, & Stoodley, 2014b, p. 316). These researchers have viewed both information literacy and information experience as alternative research objects and domains to the more prolific and established area of information behaviour in the Library and Information Science (LIS) discipline. They have also seen the value of focusing on people's experiences.

As early as 2009, Lloyd published an information literacy study titled *Informing practice: Information experiences of ambulance officers in training and on-road practice* and Yates, Partridge, and Bruce (2009, p. 275) referred to the "overall information experience" in a category of health information literacy. Both studies recognised the value of information experience. In the first publication about information experience in 2011, Bruce and Partridge observed that it was an emerging line of information literacy research which "offers a more holistic approach to understanding people's engagement with information than the behavioural approaches". They state that information experience research allows a broad understanding and interpretation of people's interaction with their information environment. In 2012, Yates, Partridge, and Bruce (2012, p. 113) observed that research in the domain was focusing on the "nature" of people's information experiences. In accordance, the research question in this study includes the word "nature" because I investigate the nature of people's information experience in using mobile devices for health and wellness.

Information experience entails a dual focus on information and experience, that is, it attends to information as experienced by people in a certain context. In contrast to information literacy research which focuses on information and learning simultaneously, information experience views phenomena through an alternative information research frame (Bruce & Partridge, 2011) or a purely information-related lens (Partridge & Yates, 2014). Although these researchers acknowledge that learning was present, it was not the focus. Bruce et al. (2014a) state that attention to information experience has stemmed from interest in people's

lived experiences in their life worlds which are terms central to phenomenology. The life world refers to the world of immediate experience and information experience research examines people's informational life worlds in particular (Given, 2008, cited in Partridge & Yates, 2014). Thus far, information experience researchers consider people and their environments to be inseparable and also see experience as inseparable from the purposes and contexts within which it occurs (Bruce et al., 2014a). They recognise the integral role that context plays in shaping a person's information world (Haidn et al., 2014, p. 19) and that information practices and information actions shape the way information is experienced (Harlan, 2012). In my study, participants' information worlds are framed in the context of using mobile devices for health and wellness.

2.3.2 Information experience research

Bruce et al. (2014b, p. 316) state that "in our QUT [Queensland University of Technology] team, people's information experience is clearly developing as a significant research strand". In 2014, only three published studies existed which explicitly stated that "information experience" was the research object. These included studies on information experience in social media during a natural disaster (Bunce, Partridge, & Davis, 2012; Yates & Partridge, 2014) as well as a study on information experience during a political election in which the authors themselves observed that very few studies explored information experience as a research object (Haidn et al., 2014).

Bunce, Partridge, and Davis (2012) studied the information experience of using social media during the 2011 Queensland floods. They identified "different stages of a crisis and the variation in social media requirements that exists within each phase" (p. 43). Each phase was a category of experience. Following, I highlight categories in italics for emphasis. The first category *Monitoring information* involved the ongoing monitoring of news about the flood to stay informed which was experienced in a solitary manner. In the second category *Community and communication*, the information experience was characterised by the need to communicate with individuals and organisations about the flood. The third category *Affirmation* (alternatively referred to as "assurance") involved information sharing which included posting verbal updates or photographs. Participants also actively sought information to share with others. In the fourth category *Awareness*, participants sought new visual or text-based information or encountered information when browsing through comments on social media. The study did not mention the experience of participants accessing social media via mobile devices.

Partridge and Yates (2014) published a chapter titled *Researching information experience: Object and domain* which is particularly notable because it explores both information experience and information literacy as research objects in the same context of natural disaster. Specifically, they studied two events in Queensland with the two different research objects. Information experience was the research object of the first study while in the second study information literacy was the object of study. The authors state that these studies together provided a means to critically debate and reflect on the understandings of information experience. They concluded that the two studies were both within the information research domain and that the research objects were related. They described their chapter as a conversation starter about the domain. Following, I provide snapshot summaries of the two studies which could be broadly seen as attending to health and wellness as well as safety and recovery during and after extreme climatic events.

In their study on the information experience of using social media during the natural disaster titled *Socially resilient,* Partridge and Yates (2014) found key themes including: *Characteristics* (which referred to the nature of information)*; Complementary* (referring to information sources)*; Mainstream media; Connected; Wellbeing; Coping; Brokerage* (that is people became information brokers on social media during the disaster)*; Helping;* and *Journalism.*

In their study which aimed to investigate people's information literacy experiences of natural disaster titled *Informed resilience,* Partridge and Yates (2014) found the following categories: *Witnessing environmental change; Building an information network; Helping to inform others; Learning about a natural disaster; Drawing on past experience;* and *Understanding significance* (of the natural disaster). Understandably, participants in both studies valued connecting or networking highly. Social media was a platform for information via both technical and social connection during disaster.

Identifying information experience as the research object, Haidn et al. (2014) found five key themes in their research about voting in the 2012 Queensland election. *Information sources* described what was experienced as information from a broad range of information sources such as television, radio, newspapers, leaflets, signs, websites and social media. *Information flow* refers to how the information was experienced in both a push and pull manner. Several participants disliked pushed information such as flyers or leaflets in the mail. *Personal politics* revealed the context of the person's information experience. This was core to the experience which influenced what information sources they used as well as how they

engaged with them. *Party politics* also revealed the context of the person's information experience. Knowing about current politicians and being able to understand the policies of the parties were key to the person's information experience. *Sense making* was another core part of the information experience that revealed the context. This theme included conversations with family, friends and colleagues which helped participants to make sense of the election. In their study, Haidn et al. (2014, p. 12) describe information experience as an "emerging construct" which can be a research object, sitting alongside other information research objects such as information practice, information literacy, information seeking and information sharing. I have a different view in my study because I see information experience as an inclusive research object that considers all these objects and any other contextual variables that are part of the experience.

Although the term "information experience" is relatively new and studies are scarce, the concept of information experience is well supported by Bruce's program of research on the relational view of information literacy (1997) and informed learning (2008). Researchers with a relational perspective of information literacy have adopted the phenomenographic approach which sees individuals as inseparable from their worlds. Examples include Bruce (2008); Lupton (2008); Yates, Partridge, and Bruce (2009; 2012); as well as Yates (2013); and Demasson (2014). Research in these studies is about the different ways in which people experience using information to learn. The subject-object orientation sees people (learners) as the subject and information as the object. The relational perspective of information literacy predates, supports and informs information experience as a construct. (This perspective is outlined in the next section). Rather than seeing people as learners, I see people as experiencers (which includes being health consumers and mobile device users). Although I focus on experience in this study, learning was not excluded.

Notably, Bruce et al. (2014a, p. 6) state that information use is sometimes employed in describing information experience and "in these cases it encompasses the breadth and width of what we would consider information experience". Partridge and Yates (2014) also consider both their studies (that is, the study with information experience as research object and the study with information literacy as research object) to be situated within the same research domain because both studies were theoretically situated within the interpretive research paradigm. They also considered that each project could be located within an information experience research domain because both were grounded and influenced by phenomenological traditions which entailed the idea of the life world.

Information experience relates to the experience-based relational approach to information literacy research which I discuss in depth in the next section. Historically and epistemologically, information experience is inextricably linked with the relational approach to information literacy (and the relational approach is inextricably linked with phenomenography). After studies which explicitly state that information experience is the research object, I consider information literacy studies with an experiential perspective to be the most closely related in philosophical stance and theoretical approach. However, research with this perspective has only recently ventured outside formal education and professional cohorts. In this chapter, I explore information literacy, mobile information literacy, health information literacy and health literacy.

2.4 INFORMATION LITERACY RESEARCH

In this section, I discuss the development of information literacy as a concept and as a research domain. This includes an outline of three major theoretical approaches to information literacy and the three research contexts which includes research study examples. I situate this study within the everyday life research space and suggest that the prolific use of mobile devices warrants reconsideration of the concept of context because mobile devices transcend traditional contexts.

2.4.1 Background

Paul Zurkowski, a former president of the Information Industry Association, first coined the term "information literacy" in 1974, so it has a history in the Library and Information Science (LIS) discipline. Bruce (2014) describes Zurkowski's coinage as a conceptual leap with impact beyond measure. Information literacy research has focused chiefly on academic and educational contexts (Bruce, 2000; 2008; Lloyd & Williamson, 2008). Johnston and Webber (2003) state that information literacy is the term used to describe several initiatives in higher education that aim to meet the diverse demands of the information society. These demands are a result of cultural, social and economic developments and information literacy is a practical response.

Johnston and Webber (2003, p. 336) distinguished between information technology literacy and information use. This was in response to a "tendency for information literacy to be confined by a narrow 'library skills' or IT agenda". Garner (2006, p. 68) identified information literacy as a basic human right in a digital world and "the core literacy which

makes the others possible". Similarly, Mackey and Jacobson (2011, p. 70) see information literacy as:

> the metaliteracy for a digital age because it provides the higher order thinking required to engage with multiple document types through various media formats in collaborative environments.

Bruce (2000) identified four phases of information literacy research from the 1980s until the present day and beyond. These phases are outlined below.

Phase 1: (1980s) Precursors

The concept of information literacy was established and there was a focus on information skills, bibliographic instruction and processes such as Kuhlthau's Information Search Process (1998; 1993).

Phase 2: (1990-1995) Experimental

Doyle's (1992) study in the United States led to the term "information literacy" being widely understood and used.

Phase 3: (1995-1999) Exploratory

Information literacy gained momentum in educational contexts and interest in workplace contexts began. Alternative paradigms to the positivist approach to information literacy were explored. Examples include the cognitivist and the constructivist approach. Bruce (1997) developed the relational approach to studying higher educators' views of information literacy.

Phase 4: (2000-) Evolving

Bruce (2000, p. 95) predicted "the development of a community of researchers and research teams; growth in research beyond the educational sector, particularly the workplace and community; attention to a wider variation of cultural settings". Information literacy research continues to expand and evolve in all the sectors Bruce predicted and has also developed alternative perspectives as outlined in the next section. As discussed previously, information experience research has also recently emerged from information literacy research.

2.4.2 Theoretical frameworks

In a grounded theory study, it is not necessary to adopt a theoretical framework prior to data collection and analysis. However, because information experience is related to information literacy, it is important to review information literacy perspectives. Therefore, the following

section outlines the various theoretical approaches in information literacy research. Each of these approaches interprets information literacy differently. The three main theoretical approaches are based on:

- the behavioural perspective of information literacy;
- the relational perspective of information literacy; and
- the sociocultural perspective of information literacy.

I also outline a fourth minor strand of information literacy research perspective known as Foucauldian discourse analysis.

Information literacy research originates in higher education and has a long tradition of cognitive and behavioural approaches. The behavioural or skills-based approach is the historical and traditional approach used in the development of information literacy curriculum, standards and teaching practice. Limberg (2000) highlights the shift from a system centred approach to user centred studies in the 1980s that influenced the use of qualitative methods in Library and Information Science (LIS) research. She states that information needs, information seeking, and information use involve "complex human processes that require in-depth understanding of human experiences" (p. 52). Continuing the shift or evolution, the relational and sociocultural views in tandem with qualitative research methods such as phenomenography and grounded theory offer new experiential perspectives. The following is an outline of the theoretical perspectives of information literacy.

2.4.2.1 The behavioural perspective

Historically, most information literacy frameworks and models were developed in higher education in Western countries and they typically emphasise processes, attributes or behaviours. The following are examples.

The *Big6 skills* process for problem solving using information was developed in the United States (Eisenberg & Berkowitz, 1990). The model provides a framework for teaching and promotion of information literacy in formal education (which includes kindergarten). The six main stages of the process are: task definition; information seeking strategies; location and access; use of information; synthesis; and evaluation.

In 1992, Doyle produced a commissioned report on information literacy for the National Forum on Information Literacy in the United States. This report defined an information literate person as someone who: recognises the need for information; recognises that accurate

and complete information is the basis for intelligent decision making; formulates questions based on information needs; identifies potential sources of information and develops successful search strategies. Doyle's influential study defined information literacy as being "the ability to access, evaluate, and use information from a variety of sources" (1992, p. 2).

In the United Kingdom, the Society of College, National and University Libraries developed *The Seven Pillars Information Skills Model* (SCONUL, 1999). Librarians and teachers around the world have used the model to deliver information skills to their learners. The seven pillars of information literacy are: identify; scope; plan; gather; evaluate; manage; and present. To enable the model to be applied in specific situations, SCONUL developed "lenses" for digital literacy and research literacy.

In the United States, the *Information Literacy Competency Standards for Higher Education* provided a framework for assessing the information literate individual (ACRL, 2000). This is a five-standard process based on an information need. *The Australian and New Zealand Institute for Information Literacy Framework* was adapted from the Association of College & Research Libraries (ACRL) standards (Bundy, 2004). In Australian universities, information literacy educators often adopt this framework for curriculum development and implementation.

The behavioural perspective has limitations. For example, Johnston and Webber (2003, p. 337-338) were critical of the behavioural perspective to information literacy education, arguing that the ACRL strategy may result in a "tick the box" approach and, similarly, the *Big6 skills* may encourage a "recipe approach" to information literacy. Process-oriented models for information literacy education are clear and formulaic. However, they were developed from the behavioural perspective and are not always transferable to everyday contexts. A general observation is that they typically aim to define, simplify or condense the attributes or behaviour of an information literate person. However, typically, human experience is neither measurable nor simple.

2.4.2.2 The relational perspective

To reiterate, I consider information literacy research with an experiential perspective to be closely related to the perspective of information experience research thus far. Bruce's (1997) landmark relational model is an experience-based perspective in information literacy research. From the relational perspective, an information literate person is one who "values information and its use, approaches information critically and has developed a personal information style" (Bruce 1997, p. x). Originating in higher education, Bruce's (1997)

relational model presents seven faces or ways of experiencing information literacy in a human-information relationship. She (1997, p. 151) posits that information literacy is not a linear process or a set of skills. Rather, information literacy is a relationship between people and information that is complex and context dependent. Table 1 below outlines Bruce's seven faces (or conceptions) of information literacy.

Table 1 The seven faces of information literacy (Bruce, 1997)

Category (Face)	How information literacy is seen
Category 1: The information technology conception	Information literacy is seen as using information technology for information retrieval and communication
Category 2: The information sources conception	Information literacy is seen as finding information located in information sources
Category 3: The information process conception	Information literacy is seen as executing a process
Category 4: The information control conception	Information literacy is seen as controlling information
Category 5: The knowledge construction conception	Information literacy is seen as building up a personal knowledge base in a new area of interest
Category 6: The knowledge extension conception	Information literacy is seen as working with knowledge and personal perspectives adopted in such a way that novel insights are gained
Category 7: The wisdom extension conception	Information literacy is seen as using information wisely for the benefit of others

The relational model of information literacy itself can be seen as an example of the knowledge extension conception (Category 6) in that Bruce (1997) gained novel insight from the perspectives of academics, librarians and learning advisors. The result was an alternative perspective that viewed information literacy as a relationship between information and the user rather than as a set of competencies.

While *The seven faces of information literacy* provided a theoretical understanding of information literacy, *Informed learning* (Bruce, 2008) expanded the definition of information literacy and defined informed learning as being able to draw upon different ways of experiencing using information to learn. Bruce (2014) states that the publication renewed

interest in experiential thinking in information literacy research and practice. Informed learning supports active, experiential and reflective learning in various contexts.

The relational perspective and phenomenography are intertwined in information literacy research both conceptually and historically. Bruce (1997) used the approach to develop the relational model, and the relational approach is based on the phenomenographic conceptual framework. Information literacy may be described as a series of varying relations between people and information according to the phenomenographic principle of the subject-object relation (Bruce, 1997). Phenomenography is a research approach to investigating different understandings of reality. The approach is associated with Ference Marton and his colleagues at the University of Göteborg in Sweden. Phenomenographers adopt a second-order perspective through which they try to see the phenomena through the eyes of other people (Marton, 1981).

Examples of research using the relational model are numerous especially in a higher education context. Researchers such as Edwards (2006); Lupton (2008); Hughes (2009); Andretta (2012); and Johnston (2014) adopted a second-order perspective to examine the various ways students experienced information literacy. Andretta (2012) used a relational approach to investigate the information literacy experience of postgraduate students studying Information Services Management. She chose the relational model because the purpose of the research was "to explore what information literacy means to the learner" (p. 1). More recently, Miller (2014) used informed learning as a conceptual framework in her study on early career academics. She states that the concept of informed learning fundamentally represents the relational approach to information literacy.

Yates (2013) used the relational model in her study of everyday health information literacy. (I outline her doctoral study in the health information literacy research section in this chapter). Yates (2013, p. 6) states that the relational perspective considers "the different ways in which people interact with elements of their information worlds". Notably, Hughes' (2009) study is an example where the relational model was *not* used in tandem with phenomenography. She introduced the expanded critical incident technique to accommodate her evolving research needs.

More recently, Bruce (2014) shared fresh insights into her relational model categories (or faces), explaining that the first four are more information experience oriented while the last three are more learning focused. Although information literacy research with an experiential perspective is the most closely related to information experience, only a few studies have

ventured into the workplace and everyday life. Most relational approach research is situated in Western higher education.

2.4.2.3 The sociocultural perspective

The sociocultural perspective of information literacy is a more recent theoretical approach to research. Like the relational perspective, it is experiential, context aware and provides an alternative to the behavioural approach. Both perspectives also focus on information practices. The two perspectives spring from different sources yet have features in common.

The sociocultural perspective stems from Soviet Russian psychologist, researcher and educator Lev Vygotsky and later, Lave, Lemke, Rogoff and Wertsch. Sociocultural theories focus on the relationships between human action (and interaction) as well as the context in which actions take place. Examples of context include social, cultural and historical. Vygotsky (1978; 1986) believed that knowledge is first constructed in a social context (interpsychological) and then internally by the individual (intrapsychological).

Information practice research focuses on how people seek, share and use information, and it does so within a sociocultural framework (Savolainen, 2007). While the discourse on information behaviour mostly draws on the cognitive viewpoint, "information practice is mainly inspired by the ideas of social constructionism" (Savolainen, 2007, p. 109). According to Lloyd (2010), information literacy can be considered a complex sociocultural information practice. Over time, information literacy practice results in a transition of an individual's identity and position within a community.

The research of Lloyd (2006; 2007); Fafeita and Lloyd (2012); Lloyd, Kennan, Thompson, and Qayyum (2013); and Wang (2010) are examples of the sociocultural approach to information literacy. Lloyd's research into the information literacy practices of firefighters in 2007 was one of the first inquiries into information literacy from a sociocultural perspective. Lloyd (2006; 2007) advocates moving away from Cartesian approaches and textual skills to using a whole-body approach to understanding the complex sociocultural and embodied nature of information environments. In 2006, she observed that firefighters use their body as a source of sensory information which enables the development of "fire sense". Novice firefighters rehearsed their roles and work practices in a community of practice until they become experts.

A community of practice is a "system or relationships between people, activities, and the world" (Lave & Wenger, 1991, p. 98). The theory of a community of practice stems from

Vygotsky and was developed with Lave and Wenger's (1991) concept of situated learning and legitimate peripheral participation inspired by apprenticeships. "Peripheral" denotes the diverse "ways of being placed within the fields of participation defined by the community" and participation is a means to becoming a competent practitioner (Lave & Wenger, 1991, p. 36). Harlan (2012) states that a communities of practice framework provided a structure for describing teenagers' virtual communities in her information practice study by defining the boundaries of a virtual site. While I see information experience as an inclusive object of study, Harlan (2012, p. 153) sees experiences of information and information actions as "components" of information practice.

Wang (2010) applied sociocultural theories in her doctoral study. She aimed to investigate a process for integrating information literacy across academic curricula involving a community of academic staff, librarians, learning designers, Information Technology support staff and herself as researcher. Wang (2010, p. 9) states that the knowledge to do so "does not exist and cannot be discovered, instead it needs to be developed and constructed through interaction in a collaborative environment". The focus on social collaboration is key. The sociocultural perspective of information literacy focuses on the influences of social and cultural environments.

2.4.2.4 Foucauldian discourse analysis

Although a minor strand of information literacy research, Foucauldian discourse analysis is another alternative to the predominant behavioural perspective. This discursive perspective is a research approach based on the theories of French philosopher Michel Foucault that focuses on power relationships in society. When using this approach, a researcher tries to "identify the specific lens and background assumptions that underpin a specific way of discussing information literacy" (Limberg, Sundin, & Talja, 2012, p. 111). Lundh and Lindberg (2012) state that three theoretical perspectives have been influential in Nordic information literacy research, namely phenomenography, sociocultural theory and Foucauldian discourse analysis. Limberg et al. (2012, p. 118) observe that the three perspectives "challenge a view of information literacy as a set of generic skills".

I have not seen this discursive approach in information experience research. Yet, I think that a critique would help conceptualise the climate of the relatively new information experience movement which emerged from the experiential perspective of information literacy research and is contributing to the turn in Library and Information Science (LIS). In summary, I have outlined four information literacy research perspectives: behavioural; relational; socio-

cultural; and discursive. Each perspective has a different research focus. Next, I outline contexts in information literacy research.

2.4.3 Research contexts

Research has expanded into new perspectives of information literacy as well as the experience of information literacy in different contexts. The emergence of the information experience domain and this study illustrate this expansion. Historically, information literacy research started in formal education. However, there is also a history of studies not sitting neatly into one context. For example, Bruce's (1997) study could be considered both in the education and workplace context as it was a study of academics in higher education. Gunton (2011) straddled work and everyday life contexts by including employees and unpaid participants in church communities.

Yates, Partridge, and Bruce (2012) highlight the significant gap of research into information literacy in everyday life (or community) and work settings. Attention is shifting to these settings and diverse study examples follow. Each context reveals a new facet of information literacy research.

2.4.3.1 Everyday life contexts

Examples of everyday life information literacy studies include Lloyd et al.'s (2013) inquiry into the information literacy practices of refugees; Harlan's (2012) study of teen content creators in California; Walker's (2012) work on the information worlds of parents of young children in the United Kingdom; Demasson et al.'s (2011) study into information literacy among heritage volunteers engaged in serious leisure; and Williamson's (2010) ethnographic study of Australian online investors. In the United Kingdom, Marshall, Henwood, Carlin, Guy, Sinozic, and Smith (2009) studied information use and information literacy in the context of weight management. Health information literacy and health literacy are discussed later in this chapter.

2.4.3.2 Workplace contexts

Examples of information literacy studies in a workplace context include Sayyad Abdi, Partridge, and Bruce's (2013) research on how website designers experience information literacy; Fafeita and Lloyd's (2012) exploration of the information literacy practices of apprentice chefs; Lloyd's (2009) study on the information experience of ambulance workers; and, in Sweden, Sundin, Limberg, and Lundh's (2008) investigation into librarians' information literacy expertise in the domain of nursing education. Note that the context could

also be considered higher education because the librarians were at universities. Whether framed by a relational or sociocultural perspective, these studies were oriented towards participants' information experience.

In summary, the relational model used in tandem with phenomenography was a significant development in information literacy research. Bruce (2000, p. 94) defines this as the "exploratory phase" which provided new insights and direction to information literacy. Similarly, during the continually "evolving phase" of information literacy the sociocultural perspective has shed new light on the social and embodied nature of information literacy. Arguably, information experience as a construct and a domain can also be seen as a significant development in information literacy research. This study explores information experience in an everyday context, or perhaps two or more contexts because the studied experience is not limited to a curriculum, campus or cubicle. The concept of context may require rethinking because mobile interactions transcend traditional contexts.

Having presented a discussion on information literacy research, the next section of this chapter turns to the concept of mobile information literacy followed by a discussion on health information literacy research.

2.4.4 Mobile information literacy

Several small studies and papers reflect the idea of mobile information literacy as a growing branch (or bud) of information literacy research. These studies originate from Library and Information Science (LIS) in higher education as well as from communications research. Like information literacy, mobile information literacy is expressed and understood in diverse ways.

In the United Kingdom, Walsh (2012) used the term "mobile information literacy". His journal article titled *Mobile information literacy: A preliminary outline of information behaviour in a mobile environment* appears in an information literacy journal but largely focuses on behaviour rather than information literacy. Walsh interviewed five computing or information professionals who were all experienced users of mobile devices with Internet connectivity and coded transcripts using a grounded theory approach. He examined how mobiles change information behaviour and concluded that findings can be applied to library practice. Walsh found six aspects of information engagement on the move (the following six dot points) and split them into three themes:

How people search for and evaluate information on the move:

- searching for information is quick and easy;
- information needs are contextual;
- searching can be social, for example, using social network sites.

How people use information and create new knowledge on the move:

- our memory can be outsourced;
- mobile internet acting as a bridge between devices.

The "always on" nature of mobile

- information is constantly pushed to us.

Information searches were typically contextual or related to searchers' activities and physical environments. Across all interviews, participants described the phenomenon of outsourcing memory or "carrying information around with them they may otherwise have needed to remember" while one participant reported that this allowed space for higher thinking (Walsh, 2012, p. 64). Some participants raised concerns about their inability to cope with the "always on" nature or being constantly connected and seriously distracted at times. Walsh (2012, p. 67) concludes that:

> an individual's information behaviour could be significantly different when using mobile devices or when they are on the move, compared within our library buildings, or from a fixed device.

New York City college librarians, Havelka and Verbovetskaya (2012, p. 22), also used the term "mobile information literacy". They state that "it's time to leverage students' addiction to smartphones and teach them information literacy in a mobile setting" (p. 22). Subsequently, Havelka (2013) described how a mobile information literacy program was integrated into the college curriculum, stating that tablet computers would be included in the future. As early as 2010, Murphy, a librarian at Yale university, encouraged "mobile literacy" and advocated welcoming the "mobile culture into the library information-seeking experience" (p. 17). This was in response to researchers using mobile devices more and more. Murphy also used the phrase "mobile experience" (p. 17) and "mobile information experience" (p. 18). Parry (2011, p. 16), a media and communications academic, used the term "mobile web literacy" when describing the need to teach university students how to use mobile technologies and states that the mobile web presents many pedagogical possibilities.

In Japan, Hashizume, Yamanaka, and Kurosu (2011, p. 227) used the term "mobile phone literacy" in their study of user experience of Information and Communication Technology (ICT) devices among elderly people. The term seems to refer to how much people know about the functions of a mobile phone.

The term "literacy" is often used differently in broader literature compared to the understanding of information literacy in Library and Information Science (LIS) studies. From the outset, I found studies that do not use the term "information literacy" and, yet, use similar concepts as well as studies that use the terms "health information literacy" and "literacy" in different ways to Library and Information Science (LIS). This may be a consequence of varying views of the concept of literacy and the multidisciplinary nature of this topic.

2.4.5 Health information literacy research

Like information experience, health information literacy as a construct and a research domain stems from information literacy research. Given this shared history and that this study investigates people's information experience in using mobile devices for health and wellness, an understanding of health information literacy research is important. This section discusses the emergence of health information literacy and reviews research that has investigated people's health information literacy in everyday life. Consistent with the relational perspective of information literacy, Yates (2013) sees health information literacy as the different ways in which people experience using information to learn about health. This reflects the experience-based views of a cohort of researchers in Australia. In contrast, a group of researchers in Finland understand health information literacy from a behavioural perspective.

DeBuono (2006), a public health expert in the United States, suggests that information literacy is the most important predictor of an individual's health status. Yates, Partridge, and Bruce (2009) also highlight the synergies between information use and health status and the need for greater understanding about how people use information to learn about their health.

Health information literacy is a nascent focus of interest in the information literacy research arena. The Medical Library Association Task Force on health information literacy defined health information literacy as:

> the set of abilities needed to: recognize a health information need; identify likely information sources and use them to retrieve relevant information; assess the quality of the information and its applicability to a specific situation;

> and analyze, understand and use the information to make good health decisions. (Medical Library Association 2003, para. 5)

Several recent studies explore health information literacy in everyday life. These studies, based in Australia and Finland, mostly focus on older people (Yates, Partridge, & Bruce, 2009; Yates, Stoodley, Partridge, Bruce, Cooper, Day, & Edwards, 2012; Yates, 2013; Stoodley, Bruce, Partridge, Edwards, & Cooper, 2014; Eriksson-Backa, Ek, Niemelä, & Huotari, 2012). In contrast, Niemelä, Ek, Eriksson-Backa, and Huotari (2012) studied secondary students. The first four studies all focus on the health information literacy experience of ageing or older Australians using a phenomenographic approach. These studies, which I outline following, did not include young participants and did not mention mobile device use in research findings. The use of verbs at the start of category names is uniform in these studies.

In the first of the four studies, Yates, Partridge, and Bruce (2009) found that ageing Australians experienced health information literacy as: *Striving for wellness* (people try to achieve better health or maintain their current level of health); *Reaffirming wellness* (reconfirming "healthy" and its importance for personal wellness); *Knowing myself* (understanding the body through reading and responding to their own bodily cues); *Protecting myself* (protecting and preserving personal health); *Screening knowledge* (screening information in order to make health choices); and *Storing knowledge* (accumulating information on wellness which could be physical or non-physical "subconscious accumulation of knowledge").

In comparison, Yates et al. (2012) found that older Australians trusted medical practitioners highly and considered online information to be readily accessible but the least reliable. The researchers found that older Australians experience health information literacy as: *Storing information*; *Managing information*; *Tuning in to personal information* (that is, embodied knowledge and accumulated experience); *Making a difference with information* (that is, influencing personal health by using information to bring about changes in their life); and *Participating in an informed community* (for example, seeking information about health in collaboration with others).

Among health information literacy studies, Yates' (2013) doctoral research is particularly relevant because it introduced health information literacy as an alternative theoretical lens for consumer health information research. Specifically, she adopted Bruce's (1997) relational perspective of information literacy. Yates (2013, p. 21) advocates going beyond the context

of a specific illness to research health consumers' broader management of health. In comparison, I use an information experience lens that provides an alternative view for consumer health information research. In contrast, I diversify by investigating information experience in the context of mobile device use and a wider age range. Yates (2013) found that her participants, who were members of the "Baby Boomer" generation, experienced health information literacy in seven distinct ways: *Building a new knowledge base*; *Weighing up information*; *Discerning valid information*; *Paying attention to bodily information*; *Staying informed about health*; *Participating in learning communities*; and *Envisaging health*.

The fourth study is reminiscent of the category "Making a difference with information" in Yates et al. (2012) detailed above. Stoodley et al. (2014, p. 118) state that their categories can be considered "thresholds" or "critical points" which can launch new and different ways for the participant to experience their health environments. Categories of health information literacy include: *Absorbing* (intuitive reception and accumulation of external information); *Targeting* (a planned process of organising information that will lead to a conclusion); *Journeying* (a personal quest in which information sourced internally is useful and valid); *Liberating* (equipping for independent lifestyle choices); and *Collaborating* (interacting in community for mutual benefit). Collaboration (or participation) in a real-life community was a common thread in the last three of the four studies.

The phenomenographic studies in Australia approach health information literacy from a relational perspective while studies in Finland understand health information literacy from a behavioural perspective. While the phenomenographic studies outlined above each included a relatively small number of participants, Eriksson-Backa et al. (2012) completed a health information literacy study of a random sample of 1000 elderly Finns. The study investigated how elderly Finns perceived their ability to identify needs for health-related information and how confident they were in their abilities to find and use information. The researchers concluded that categories of elderly Finns who were more vulnerable in terms of obtaining and using information were those with lower levels of education, those with chronic health conditions and those not interested in actively seeking information.

Health information literacy as a concept varies in the literature. Eriksson-Backa et al. (2012, p. 84) state that health information literacy is a "sparsely studied concept" referred to "without being based on empirical research". Niemelä, Ek, Eriksson-Backa, and Huotari (2012, p. 126) use the term "everyday health information literacy" because they see health

information literacy as "mostly a matter of everyday occasions and general knowledge related to health and wellbeing". In their quantitative study, they measured everyday health information literacy based on a self-report questionnaire. Niemelä et al. (2012) found three distinct factors of everyday health information literacy which they described as motivation, confidence and evaluation.

Notably, Ivanitskaya, O'Boyle, and Casey (2006) used the term "health information literacy" to describe information seeking by students of medicine or health sciences. Eriksson-Backa et al. (2012) consider health information literacy to be related to health literacy and discuss health-related information behaviour, including needs, seeking and use of information related to health or medicine. In comparison, Yates et al. (2012) describe health information literacy as an emerging discourse that adopts a broader interpretation of information literacy. Bruce and Partridge (2011) similarly state that information experience research invites a broad understanding and interpretation of people's interaction with their information environment. In the interpretivist tradition, I adopt a broad understanding of information, information use and health and wellness in my study.

2.4.6 Health information literacy in libraries

Discussion about health information literacy is increasing in the Library and Information Science (LIS) discipline, among health professionals and within community settings. A common theme in this discussion is the notion of individual responsibility and empowerment, that is, advocating health information literacy so people can manage their health. For example, in Canada, Burnham, and Peterson (2005, p. 422) discuss health information literacy in a library context and advocate that "people should have access to information that is appropriate for their needs and plays an active role in their health and well-being". They describe how illness, stress, fear, cultural differences and medical jargon can affect the way in which people understand their health issues. Not surprisingly, these variables impact how people relate to health information.

In comparison, Hammond (2005), a hospital librarian in the United States, reports on a hospital-based consumer health initiative designed to promote health information literacy. She set up a new consumer health information service at a university medical centre and argues that societal changes and Internet access have heightened interest in health information among the general public. As a result, patients/consumers are more involved in their healthcare. More recently, Zionts, Apter, Kuchta, and Greenhouse (2010) discuss the

creation of the Health Information Fellowship through which librarians attain their Consumer Health Information Specialist certificate from the Medical Library Association. This initiative was in response to a market survey showing that the public library is the first port of call for many with health questions.

2.5 CONSUMER HEALTH INFORMATION RESEARCH

Participants in this study are health consumers. Hence, it is important to identify the nature of consumer health information research and how it relates to the topic under investigation. While Stavri (2001) refers to consumer health as patient and health education, Yates (2013, p. 3) used the term "consumer health information research" to describe two distinct perspectives or lines of enquiry which are health information behaviour and health literacy. She refers to consumer health information research as "literature that has in different ways investigated information in the context of consumer health" (2013, p. 8). For the purposes of this study, I adopt and adapt this broad term.

This section outlines relevant consumer health information research which includes the research areas of health literacy, health information behaviour and mobile health. Many mobile health studies promote health literacy. Mirza, Norris, and Stockdale (2008, p. 310) define mobile or m-health as "the use of small, portable and wireless computing and communication devices to meet the information and service needs of healthcare providers and consumers". They see it as both consumer and provider oriented. Mobile health is multidisciplinary and could also be included under the broad area of mobile use research outlined in this chapter. However, I see it as a prolific research area with a significant consumer health and information orientation.

2.5.1 Health literacy

Health literacy research is mostly concerned with the measurement of health literacy and the outcome of health-related interventions. Research typically explores the correlations between low literacy, health decisions, health status and health outcomes in target populations. The American Medical Association's (1999) definition of health literacy relates to basic reading and numeracy skills. Reading and understanding are vital to health literacy and several studies have found that mobile devices are conducive to promoting health literacy. Yet, the number of health literacy studies on mobile devices from the user perspective is small (Mackert, Love, & Whitten, 2009). The following are two such studies.

Based in the United States, Mackert et al. (2009) explore how mobile devices enable customisation of digital media content, maximise convenience and involve patients in the learning process. Specifically, the researchers focused on the development of two mobile device-based health interventions designed for lower-literate audiences. The interventions provided diabetes prevention information and childcare health information via two specifically designed websites, that is, with content that was easily understood. Mackert et al. (2009, p. 89) investigated how participants responded to learning health from these websites on a mobile device and found that participants "overwhelmingly approved of the design of these interventions". In comparison, Devine, Bull, Dreisbach, and Shlay (2014) developed a text messaging feature in their teen health literacy program designed to prevent teen pregnancy in minority groups. They found that teens appreciated text messages and videos about their role models and other celebrities. The "texting curriculum" entailed sending between three and seven texts per week. Teens without a mobile phone were asked to "buddy" with a fellow participant to read the text messages. Both studies in this section designed programs with easily understood digital information as a priority.

2.5.2 Health information behaviour

The recent interest in health information seeking behaviour (and other information behaviours) is the result of two different movements which occurred almost concurrently: the upsurge of the health care consumerism movements and public access to unlimited information on the Internet (Bratucu, Gheorghe, Purcarea, Gheorghe, Popa Velea, & Purcarea, 2014). These movements, which started in the late nineties, included an enhanced focus on self-monitoring and self-care (Lambert & Loiselle, 2007).

Typically, health information behaviour research investigates information behaviour in the context of a specific illness or a specific group of people. Concepts in health information behaviour research are not universal. As Stavri (2001, p. 1485) states, "different disciplines define information, information-seeking behaviour and perhaps even health from different perspectives". Following is a range of health information behaviour studies. After that, the next section outlines a small number of studies on health information behaviour related to mobile device use.

2.5.2.1 Health information behaviour: seeking, scanning and avoidance

Health information behaviour research often includes health information seeking and, less frequently, other behaviours such as information scanning and information avoidances.

Moreover, health information scanning and avoidance are typically associated with health information seeking. Scanning and avoidance are thought to be more passive and less purposeful than health information seeking. Yates (2013) observed that the definition of health information seeking provided by Lambert and Loiselle (2007) concurs with Wilson's (2000) definition of information seeking which sees it as task-oriented and purposeful. Kelly et al. (2010, p. 736) use the term "scanning" to describe how people encountered health-related information in their routine use of media and interactions with others.

Nursing academics, Lambert and Loiselle (2007, p. 1008), broadly define health information seeking as "the ways in which individuals go about obtaining information about their health, health promotion activities, risks to one's health, and illness". They found that health information seeking has been increasingly documented as a key coping strategy in psychosocial adjustment to illness. While Lambert and Loiselle (2007) specify "individuals" in their definition of information seeking, Sadasivam, Kinney, Lemon, Shimada, Allison, and Houston (2013) found that online health information seeking is a team sport and that looking for health information for someone else is common. They refer to people who search for their family and friends as "surrogate seekers" (p. 193).

Researchers have investigated health information seeking in many different cohorts such as older adults (Manafo & Wong, 2012), women's information behaviour in the context of managing menopause transition (Genius, 2012) as well as the influence of immigration on health information seeking behaviours among Korean Americans and Korean natives (Oh, Zhou, Kreps, & Wonsun, 2014). While Oh et al. (2014) found that trust in Korean language newspapers was important to Korean Americans, Genius (2012) viewed sense making as an intrinsic component of information behaviour. She found that information seekers and health professionals used strategies to construct sense from health information which included analytical as well as experiential and intuitive "postures" (that is, attitudes or stances) as they assessed and integrated information. Postures were neither static nor mutually exclusive.

Several studies focus on cancer-related information seeking in the context of health decision making. Kelly et al. (2010) found that information scanning for cancer-related information was a more frequent behaviour than information seeking. Studies often relate demographic factors to health information behaviours. For example, Sadasivam et al. (2013) found that a spouse or a parent with good health status was more likely to be a surrogate information seeker, whereas Kelly et al. (2010) found that older, educated, married females were more

likely to seek and scan cancer information. The researchers considered cancer-related information seeking to be active and information scanning to be less deliberate.

In comparison, behavioural scientists Rees and Bath (2001) found that women with breast cancer were "highly individualistic" in their information seeking behaviours and that they sometimes fluctuated between seeking and avoiding information. Similarly, in a study of people diagnosed with cancer, Lambert, Loiselle, and Macdonald (2009) underscored variation in information seeking which they state is overlooked in cancer studies. They identified five patterns of health information seeking behaviours: *Intense information seeking* (a keen interest in detailed cancer information); *Complementary information seeking* (the process of getting "good enough" cancer information); *Fortuitous information seeking* (the search for cancer information mainly from others diagnosed with cancer); *Minimal information seeking* (a limited interest for cancer information); and *Guarded information seeking* (the avoidance of some cancer information for escapism and self-protection).

While Germeni and Schulz (2014) found that information avoidance is a coping response to cancer and cancer-related information rather than a behavioural anomaly, according to Sairanen and Savolainen (2010), information avoidance is "a multi-faceted phenomenon that defies exact definition". They found in their study of university students in Finland that health information was mostly avoided because of the risk of experiencing negative emotions such as fear, anxiety and depression. Their study on uncertainty management refers to various information theories including Kuhlthau's (2004) uncertainty principle which considers feelings of apprehension or uncertainty as a natural part of a searcher's experience. In a quantitative study, Ek and Heinström (2011, p. 200), also in Finland, explain that "people with compromised health have to cope with a great deal of uncertainty caused by health related anxiety". They found that both information seeking and avoidance were important to coping with health issues. Nevertheless, health information seeking is the most prolific behaviour in health information behaviour research.

2.5.2.2 Health information behaviour research related to mobile device use

Although mobile devices are mentioned as a way to access health information on the Internet in recent research (Kratzke, Wilson, & Vilchis, 2013; Sadasivam et al., 2013), few information behaviour studies focus solely on these devices. This section provides an overview of the nature of research on health information behaviour related to mobile device use. Various research fields include information seeking behaviour on mobile devices.

Research concerned with health information sharing behaviour using mobile devices is mostly in healthcare settings rather than everyday life contexts.

In healthcare contexts, the balance between the convenience of mobile technology and security is a theme in health information sharing research. This includes the privacy of sensitive health information when using mobile technology for monitoring in healthcare (Avancha, Baxi, & Kotz, 2012). Research is also preoccupied with how healthcare professionals share information with each other via mobile devices (Luppicini & Aceti, 2011; Wu, 2014) or with patients (Baysari, Adams, Lehnbom, Westbrook, & Day, 2014). Specifically, Baysari et al. (2014) explored the impact of using an iPad to share information with patients during ward rounds. They found that although iPads provided support for both doctors and patients, doctors preferred to share information with patients verbally.

Some studies on health information behaviour touch on participant experiences. In the broad research area of health informatics, Lim et al. (2011) use elements of information behaviour research such as information seeking theory and self-efficacy theory which originated from the work of psychologist Albert Bandura (1977). In the area of community health, Kratzke et al. (2013) studied the breast cancer information seeking behaviours of rural women and mobile technology in the United States. They found that the women used multiple sources including the Internet, text-messaged mammogram reminders, mobile phone messages as well as traditional sources such as doctors, family and friends. While Kratzke et al. (2013, p. 59) conclude that "mobile technologies may help close the gap for access to online health information for some rural populations and minority groups", Lim et al. (2011, p. e191) state that "the use of mobile phones for the specific purpose of seeking health information is still a relatively new innovation".

Generally, research on health information behaviour neglects participant experiences in favour of a focus on information sources, information seeking and the sharing of medical information in healthcare settings.

2.5.3 Mobile health research

Mobile health is a prolific research area that is of peripheral yet noteworthy interest. Although participants in my study were health consumers, their experience was in the context of everyday life rather than in healthcare. Most mobile health studies relate to patient care in healthcare contexts. Mirza et al. (2008) see mobile health as both healthcare provider and consumer oriented (I provided their definition of mobile health in section 2.5). Many mobile

health studies take a consumer health perspective and promote health literacy. Similarities appear between the health literacy research of Mackert et al. (2009) and some mobile health studies as both focus on mobile health behaviour change interventions. Mobile health research also includes aspects of mobile use behaviour.

Barton (2012, p. 1) states that "mHealth applications are receiving increased attention largely due to the global penetration of mobile technologies". Given the challenges of ageing populations, chronic illnesses, disability and overburdened healthcare systems, it is unsurprising that mobile health research abounds. Consumer-oriented programs are increasing and improving the health status of people in vulnerable populations. Mobile technologies are typically used to manage chronic conditions such as diabetes (Mackert et al., 2009; Lerouge & Wickramasinghe, 2013) and asthma (Klasnja & Pratt, 2012; Mosnaim, Powell, & Rathkopf, 2012) as well as for nutrition and alternative medicine to support wellness and fitness (PWC, 2012). According to Klasnja and Pratt (2012, p. 184):

> In recent years, researchers have used mobile phones as tools for encouraging physical activity and healthy diets, for symptom monitoring in asthma and heart disease, for sending patients reminders about upcoming appointments, for supporting smoking cessation, and for a range of other health problems.

Additionally, smartphone sensor technology can track bio signals such as heart rates and blood glucose levels and provide real-time data. The convenience and portability of mobile devices are valued in fast-paced healthcare environments and in telemedicine.

The relatively low cost of mobile devices is also a compelling feature. However, some medical professionals and academics have voiced concerns about poorly designed and unregulated apps (downloadable applications for mobile devices) that may mislead consumers (Luxton, McCann, Bush, Mishkind, & Reger, 2011; Rosser & Eccleston, 2011; Barton, 2012; Kratzke & Cox, 2012) as well as the lack of privacy policies related to health apps (Sunyaev, Dehling, Taylor, & Mandl, 2014). PWC (2012) conclude that although patient and provider will always be fundamental to medicine, the healthcare professional may not always be the first option for health information.

In the past decade healthcare providers and consumers have been using mobile health apps in tandem with social media. In the United States, Mosnaim et al. (2012, p. 55) state "to our knowledge, there are no published studies using interactive mobile applications or social networking platforms to improve asthma self-management". Similarly, in Norway,

Chomutare, Fernandez-Luque, Arsand, and Hartvigsen (2011) state that the potential influence of social media on diabetes mobile health applications is largely unexplored.

In summary, both mobile health research and wider consumer health information research are chiefly focused on a specific illness or a group of people at risk. A sizeable portion of the literature reviews the features and functions of health apps. Several studies exist on the health information literacy of older people in everyday life. However, health information behaviour is mostly associated with health information seeking. Overall, Yates (2013, p. 184) found a "disconnect" between the biomedical perspective of consumer health information literature and what people experience as informing.

2.6 MOBILE USE RESEARCH

Participants in this study are mobile device users. Mobile information use research is important because mobile devices enable people to participate in social and economic activities which includes the pursuit of health and wellness. This section outlines two research areas that I broadly define as mobile use research. First, I outline information behaviour research that relates to mobile use. Second, I discuss mobile adoption and use research. Both areas inform this study. Generally, mobile use research is behavioural in focus.

2.6.1 Mobile information behaviour research

Mobile information behaviour research is focused on the information behaviour of people when using mobile devices. Researchers in this field are from disciplines such as Library and Information Science (LIS) and Information Technology. This section outlines some studies that have appeared in this space.

In 2008, Geva, Huang, and Trotman from Information Technology and Computer Science backgrounds, used the term "mobile information seeking" but were mostly concerned with the limitations of small screens. In comparison, Kassab and Yuan (2013) found that the main motivations to access the mobile Internet (that is, the Internet via mobile devices) were searching for information, the lack of computer access and the emergence of a question during a conversation or an argument.

Counts and Fisher's (2010) study examined the use of mobile social networking as an information ground. According to Fisher (writing as Pettigrew, 1999) information ground theory focuses on how people share everyday information in casual social settings such as

bus stops, supermarket queues and gyms. They form around a purpose and information sharing emerges as a by-product of this social interaction. Counts and Fisher (2010) applied theory to an online environment and found participants used the mobile social network much the same as face-to-face information grounds.

While Counts and Fisher (2010) investigated information grounds that are casual social settings, Burford and Park (2014, p. 631) found that each participant customised their tablet computer "to create an ideal information seeking environment" for themselves. In a technology report, Library and Information Science (LIS) academic, Griffey (2012, p. 8) referred to the iPad as a "magic window" that can transform into whatever information device consumers need stating "it is equally adept at browsing the Web, reading a book, playing a game, or watching a movie". Burford and Park (2014, p. 635) found that information is "ever present to the user" who keeps their tablet computer in close reach. They conclude that few studies to date examine the impact of tablet computers on information behaviour. Similarly, scant scholarly research to date is dedicated to tablet computer use for health and wellness information in everyday life.

2.6.2 Mobile adoption and use research

Mobile device use is integral to the studied experience but neglected in the everyday life context of both information experience and information literacy research. Hence, I refer to the research area of mobile adoption to inform this study. Various areas of research seek to explain predictors or motivations of (including resistance to) mobile device adoption and use. Studies in this area often focus on perceived usefulness, ease of use and mobile phone use behaviour which sometimes overlap with information behaviour. Typically, these research areas are in the disciplines of information technology, communication or psychology and assist understanding of human-mobile interactions.

Broadly speaking, mobile adoption and use research explores the impact of how people behave with and relate to mobile devices and many studies investigate mobile phone adoption and addiction. While Hur, Kim, and Kim (2013) explored the different factors that affect a consumer's intention to use a tablet computer, Humphreys, Von Pape, and Karnowski (2013) investigated the social-psychological perspectives of mobile phone adoption or, more simply, how people conceptualise and use the mobile Internet. They found "extractive" and "immersive" patterns of information consumption. "Extractive" referred to checking or looking for quick, specific information while "immersive" was characterised by longer

sessions on the mobile Internet. Sometimes extractive use led to immersive use and both could be addictive.

Although research on adoption and use behaviour is branching out to tablet computers and more diverse cohorts, studies on addictive behaviour are mostly interested in smartphones and younger people. For example, in South Korea, Kwon, Kim, Cho, and Yang (2013, p. 1) studied the smartphone addiction of adolescents considered "a vulnerable class of people". In New Zealand, Vacaru, Shepherd, and Sheridan (2014) state that research is particularly focused on younger people because of their fast and extreme adoption of mobile devices. Their teenage participants noted an indistinct line between mobile phone attachment and addiction stating that the latter interfered with real life relationships. Alternatives to the term "addiction" include "overuse", "compulsive smartphone use" (Lin, Chang, Lee, Tseng, Kuo, & Chen, 2014, e98312) and "psychological dependency" (Cheever, Rosen, Carrier, & Chavez, 2014, p. 290). "With few exceptions, literature on problematic mobile phone use examines a variety of individual and demographic differences as implied causes of the behaviour in question" (James, 2012, p. 59).

Complex functionality and sophisticated design have played a role in users' dependency (Leung, 2008 cited in Cheever et al., 2014). Research indicates that mobile phone users relate to both the medium and the message or the physical artefact and the information that it provides or mediates. For example, Barkhuus and Polichar (2011, p. 637) found that participants referred to their phones as Swiss army knives and as a loyal dog whereas Battard and Mangematin (2013, p. 236) observed that people use mobile technologies like an attic where they can store souvenirs and remember experiences. Butt and Phillips (2008, p. 347) state that "it is likely that there will be relationships between mobile phone use and personality traits and perhaps well-being". The literature indicates that complex relationships between people and their mobile phone are a feature of mobile device use. It seems that these complex relationships complicate and contextualise how information is experienced.

To date, mobile adoption and use research has largely focused on the problematic use of mobile device users. It also includes commentaries on the socio-economic cost of not owning a mobile device (Ling, 2014). The adoption of mobile devices permeates every demographic (Cheever et al., 2014). Yet, much of the literature focuses on adolescents and how psychological factors impact behaviour.

Rather than focusing on problematic behaviour or the patient experience, I explore the nature of people's mobile use in the context of everyday health and wellness. Rather than limiting

the scope to young people or older people, my study includes adults of various ages and diverse occupations. Specifically, I approach the phenomenon with an alternative information experience lens which has not been used in this context.

2.7 THE RESEARCH GAP

Many researchers worldwide advocate the need for more research on the use of mobile devices for health information, healthcare and self-care. This use can (and does) improve the health status of many people and yet scholars know little about the everyday information experience in using mobile devices for health and wellness. Numerous disciplines have produced related research using terminology and concepts that vary from Library and Information Science (LIS), the discipline from which information literacy, health information literacy and information experience originate.

This study addresses the large research gap which has resulted in part from the relative newness of smartphones and tablet computers. The gap is also the result of a traditionally narrow focus on the definition and range of information with a bias towards "documentary and codified information" (Lupton, 2014, p. 69). For this reason, Yates, Stoodley, Partridge, Bruce, Cooper, Day, & Edwards (2012, p. 473) recommend thinking more broadly about what constitutes information and "to consider how people engage with health information beyond the traditional transmissive and tangible approaches". The broad information experience perspective in my study provides an alternative experiential view to the intense focus on health information seeking behaviour in consumer health information research. These studies often overlook other information-related experiences. As Godbold (2013, p. 21) points out, popular terms in information studies research such as information needs, information sources and information seeking tend to isolate what is happening, creating the "impression of separate activities".

Only a handful of empirical information experience studies exist and none of these focus on mobile devices or health. Most information literacy research is situated in educational or workplace contexts. Naturally, what is considered authoritative, relevant or valuable "information" in an academic or workplace context is not necessarily applicable to an everyday context. In contrast, this study uses an inclusive information experience lens in an everyday context and has a multidisciplinary scope that extends beyond Library and Information Science (LIS). Bruce et al. (2014a, p. 11) state that information experience research "celebrates diversity". I value the open-mindedness of the domain which suits this

exploratory study. I also recognise that the newness of the domain presents ambiguity and territorial challenges which I have addressed in this preliminary literature review.

2.8 CONCLUSION

In this chapter, I have presented a preliminary review of literature relevant to this study. I have outlined the research territories in this study and their relationship to the topic under investigation. I have identified information experience as an information-related research object in the information experience domain. Although the abundance of empirical studies in consumer health information research and mobile use research attest to the high level of interest in the topic, no information experience studies exist about the nature of people's information experience in using mobile devices for health and wellness in everyday life.

The information experience lens in this study provides an alternative view to the traditional notion of information in Library and Information Science (LIS) which entails retrieving and obtaining information from library sources in a library collection or task-oriented information seeking. Rather, adopting a broad information experience perspective encourages consideration of all aspects that shape the way information is experienced by the cohort in this context. In the next chapter, I discuss the methodological framework that supports this study in addressing this gap in the literature.

Chapter 3: Research methodology

3.1 INTRODUCTION

In the previous chapter, I presented a preliminary review of literature relevant to this study. This chapter presents the research methodology that addressed the research question:

> What is the nature of people's information experience in using mobile devices for health and wellness?

In this chapter, I justify my constructivist grounded theory approach and provide a detailed account of the research design and implementation. First, I discuss the interpretive paradigm that underpins the study. Second, I present constructivist grounded theory as the overarching research method and explain how it diverged from classic grounded theory. Third, I outline a range of grounded theory studies in relevant disciplines to the phenomenon under investigation. Fourth, I outline the research design and implementation of the study which includes the participants, data collection and data analysis as well as discussion on maintaining quality in grounded theory. The chapter concludes with ethical considerations.

3.2 RESEARCH PARADIGM

The research paradigm (or the researcher's worldview) influences how research is designed and conducted. The term "paradigm" refers to a set of ideas or general philosophical assumptions about the nature of the world (ontology) and how the researcher understands it (epistemology). The interpretivist paradigm informed my choice of qualitative method, the research design, approach and presentation of findings. In contrast to positivist belief that there is one external reality, "interpretivists are concerned with a subjective reality" (Locke, 2003, p. 10). I adopted the interpretivist paradigm because it is congruent with my belief that reality is subjective and that people interpret their reality.

The interpretivist approach to human inquiry is frequently attributed to the sociologist Max Weber and his concept of *Verstehen*, a German word that means understanding something in its context or the "nature of the situation" (Tucker, 1965, p. 159). Interpretivists are interested in people's experiences and the meaning that they construct in various contexts and recognise that people interpret or construct multiple interpretations of reality.

Methodological congruence is important in qualitative research and so is acknowledging personal beliefs. Birks and Mills (2011, p. 36) refer to the accordance between the researcher's philosophical stance and research aims as "methodological congruence". Furthermore, Annells (1996) posits that in constructivism and interpretivism, ontology and epistemology merge because the researcher cannot be separated from whatever can be known within the overall construction of reality. Hence, it is important to acknowledge my personal beliefs relevant to the study which I do in this chapter and in my personal profile (which is at the end of Chapter 4: Research participants).

The terms interpretivism and constructivism are often used interchangeably (Merriam, 2009; Denzin & Lincoln, 2008). As a research paradigm, interpretivism emerged in response to a need for different methods in the social sciences to those in the natural sciences. Furthermore, Denzin (2009, p. 85) asserts that "in the social sciences there is only interpretation. Nothing speaks for itself".

Interpretivism and positivism are major paradigms in research. Merriam (2009) contrasts the epistemological perspectives of the interpretivist/constructivist to the positivist. The purpose of positivist research is to predict, control and generalise while interpretivists/constructivists describe, understand and interpret (Merriam, 2009). Explaining the heart and nature of information experience relies on analysis and interpretation. Thus, the interpretivist paradigm is also congruent with the aims of this study which, according to Mills, Bonner, and Francis (2006b, p. 26), supports a strong research design. Locke (2003, p. 9-10) captures my understanding of interpretivism:

> The interpretivist (and related constructivist) paradigms are distinguished by an interest in understanding the world of lived experience from the point of view of those who live it. [Furthermore] interpretivists believe that in order to understand the world, researchers must engage with and participate in it, and they must actively interpret it.

In accordance with the interpretivist paradigm (and other kinds of qualitative research), I actively interpret my participants' lived experience in context and consider the researcher to be the primary instrument for data collection and analysis. I also recognise that, in constructivist grounded theory studies, the researcher and participant negotiate or co-construct meaning. Merriam (2009) positions grounded theory as a type of interpretivist/constructivist research which reinforces the accord between my research paradigm and method.

3.3 RATIONALE FOR USING CONSTRUCTIVIST GROUNDED THEORY

From the outset, I aimed to develop a theory that is relevant and relatable to people in everyday life. Historically, one of the original aims of grounded theory was to develop a theory that was "readily understandable" to students and lay people (Glaser & Strauss, 1967, p. 3). Charmaz (2006, p. 183) also advocates that grounded theorists present interpreted findings that people can use in their everyday worlds. Grounded theory (or, more precisely, constructivist grounded theory) informed my approach to this study. The aim of the constructivist approach is "to understand how – and sometimes why – participants construct meaning and actions in specific situations" (Charmaz, 2006, p. 130).

Since the research was exploratory in nature, I chose a qualitative approach and a rigorous, collaborative research method. Charmaz's method suited the aim of the study and the nature of the open-ended research question because it does not require an existing model or framework, rather it generates new theory. Information experience as a research object and research domain is relatively new and in a developing phase. No information experience theory exists in the context of mobile device use or health and wellness. The method has a solid history in information research and consumer health information research which I discuss in this chapter. It also has a presence in mobile use research (which was outlined in the preliminary literature review and is summarised later in this chapter). Therefore, I consider constructivist grounded theory to be a logical choice.

In terms of methodological congruence, Charmaz (2006, p. 130) states that her constructivist grounded theory "lies squarely in the interpretive tradition", so the method fits with my interpretivist worldview. Constructivist grounded theory's combination of systematic principles for qualitative inquiry and emphasis on the researcher-participant partnership also resonated with me personally. So too, did the pragmatic orientation of grounded theory that seeks to do good. A relevant and relatable theory has the potential to do good in practice. For the most part, I understood and appreciated Charmaz's (2006; 2014) approach to research which attends to people's thoughts, feelings and actions because of her vivid writing style. In short, I determined that her method was the best means of addressing the research question.

3.4 SITUATING CONSTRUCTIVIST GROUNDED THEORY

Constructivist grounded theory, as a systematic, iterative method has a history of influences and voices because it is a revised version of "classic" grounded theory. Developed in the 1960s, classic grounded theory itself was influenced by positivism, pragmatism and symbolic interactionism. Understanding constructivist grounded theory as a method requires historical context. In the 50 years or so since its discovery, grounded theory has diverged into three major versions:

- Glaser (alternatively known as the Glaserian, classic, classical, traditional or formal grounded theory);
- Strauss (alternatively known as the Straussian or Strauss and Corbin grounded theory); and
- Charmaz (or constructivist grounded theory).

In the following section, I trace the origins and evolution of grounded theory to situate constructivist grounded theory among other versions historically and epistemologically. This entails diversity and conflict including argument over what "theory" is in grounded theory.

3.4.1 Origins and evolution of grounded theory

Grounded theory's origins are in the United States. In 1967, two sociologists, Barney Glaser and Anselm Strauss, published *The Discovery of Grounded Theory* which outlined their method for the generation of theory from qualitative data. Glaser and Strauss collaborated because they were disenchanted with the nature of theorising in sociology and "they shared a conviction that theory needed to be intimately connected to rich observational data" (Locke, 2003, p. 29). Grounded theory is a set of systematic principles for conducting research and analysing *inductive* data. This means that the method is focused on the discovery and generation of theory from empirical data rather than verification of hypotheses. Grounded theorists do not start with hypotheses, rather they work from the data up to more abstract concepts to construct theory. Data analysis is an iterative process of coding that follows the principle of constant comparison which is a method of analysis that involves comparing data, codes and categories repeatedly throughout the study. Grounded theory is also the product of the research process – the product being the conceptually abstract theory generated from data analysis.

According to Mills et al. (2006b, p. 32) constructivist grounded theory originates from Strauss (1987) as well as Strauss and Corbin (1990). Mills, et al. (2006b) state that these works are underpinned by a relativist position and constructivism is exemplified in the belief that the researcher constructs theory through interpretation of participant voices. However, Kathy Charmaz (2000), a sociologist (and a former student of Glaser and Strauss), was the first to *describe* it as "constructivist grounded theory". Charmaz states that she refers to her version as "constructivist" to distinguish it from earlier forms of social constructionism that viewed the research participants' actions as constructed but not the researcher's actions (2009, p. 133-134). Constructivism emphasises co-construction of meaning and knowledge by the researcher and participants and it recognises that the life of an individual is made up of multiple realities, truths and perspectives. Vann-Ward, Morse, and Charmaz (2017, p. 966) situate constructivist grounded theory stating that it:

> shares the theoretical framework of symbolic interactionism, builds on the pragmatic perspective, and develops the constructionist point of view through interpretative understandings of individuals' subjective experience.

Grounded theory history is characterised by diversity and conflict. Charmaz (2014, p. 14) describes grounded theory as a "constellation of methods" with diverse influences and epistemological assumptions. Although grounded theory was "discovered" in 1967, according to Hammersley (1989, cited in Mansourian, 2006, p. 387), its "roots lie in symbolic interactionism, which itself stems from pragmatist ideas of James, Dewey, Cooley and Mead". Symbolic interactionism is a strand of interpretivism in which meaning (of self, society and reality) is derived from social interaction (Crotty, 1998, p. 72). Grounded theory is also pragmatically oriented in that it seeks to be useful and do social good (Seldén, 2005, p. 117). The symbolic interaction influence is evident in grounded theory's focus on understanding the meaning of social processes or actions. Glaser and Strauss brought two contrasting traditions to grounded theory. Glaser was versed in Columbia University positivism and quantitative methods while Strauss was immersed in Chicago School pragmatism and symbolic interactionism where Dewey and Mead once held faculty positions.

Grounded theory has a diverse heritage and a simple timeline of major publications (Table 2) tells a story of the divisions, revisions and evolution.

Table 2 Timeline of major grounded theory publications

Year	Author	Title
1967	Glaser and Strauss	*The discovery of grounded theory*
1978	Glaser	*Theoretical sensitivity: Advances in the methodology of grounded theory*
1987	Strauss	*Qualitative analysis for social scientists*
1990	Strauss and Corbin	*Basics of qualitative research: Grounded theory procedures and techniques*
1992	Glaser	*Basics of grounded theory analysis: Emergence vs. forcing*
2006	Charmaz	*Constructing grounded theory*
2014	Charmaz	*Constructing grounded theory* 2nd Edition

After their original publication in 1967, Glaser and Strauss parted ways. Glaser (1978) focused on theoretical sensitivity while Strauss collaborated with his student Juliet Corbin (1990) in a move away from the original concept of emergence. Rather, they focused on verification using axial coding as well as participants' creation of meaning. According to Mills et al. (2006a, p. 9), "historically, the original grounded theorists paid scant attention to their relationships with participants, instead viewing participants' words and actions as a source of data". Thus, Strauss and Corbin (1990) had published a new approach.

In 2006, Charmaz published *Constructivist grounded theory*, which presented her revised version of grounded theory that focuses on the co-construction of meaning between researcher and participant. Mills et al. (2006a, p. 8) describe a partnership or mutuality between researcher and participant in the constructivist research process that requires a rethinking of the grounded theorist's traditional role of objective observer. Constructivist grounded theory goes beyond interaction and sees the researcher and participants as partners. Charmaz (2009, p. 129) describes her version of grounded theory as "the constructivist challenge" and a "contemporary revision" of Glaser and Strauss' classic grounded theory. Particularly resonant with my worldview, Charmaz (1990, p. 1162) states that people experience their constructions as reality:

> In short, the researcher constructs theory from the data. By starting with data from the lived experience of the research participants, the researcher can, from the beginning, attend to how they construct their worlds.

The constellation of grounded theory methods includes many voices and debate exists regarding methods and the very nature of grounded theory. This controversy began with the founders which led to their split. Glaser (1992) states that what Strauss and Corbin (1990) wrote in their book was no longer grounded theory while Strauss argues that Glaser's version places too much emphasis on induction. Glaser (2002) also states that Charmaz's constructivist grounded theory is not grounded theory.

The starkest contrast between the versions is Glaser's disinterest in relating to participants in order to be an objective observer. In contrast, Charmaz values the researcher's personal experience and capitalises on co-construction of meaning with participants (which I discuss later in this chapter).

3.4.2 Common components of grounded theory

Although various versions of grounded theory exist, overall these versions have common components which Charmaz (2014, p. 7) outlines:

- simultaneous involvement in data collection and analysis;
- constructing analytic codes and categories from data, not from preconceived logically deduced hypotheses;
- using the constant comparison method, which involves making comparisons during each stage of the analysis;
- advancing theory development during each step of data collection and analysis;
- memo-writing to elaborate categories, specify their properties, define relationships between categories, and identify gaps;
- sampling aimed toward theory construction (theoretical sampling); and
- conducting the literature review after developing an independent analysis (Charmaz, 2014, p. 7).

To elaborate, the grounded theory method produces new theory (either substantive or formal). Note that Charmaz uses the term theory "construction" while classic grounded theory sees theory as "discovery". Constructivist grounded theory shares the same defining components

as classic grounded theory and I discuss each of these components further in the data analysis section of this chapter.

Other differences between constructivist grounded theory and classic grounded theory are the definition of "theory" and constructivist grounded theory's focus on co-construction. I discuss each of these in this chapter. However, I first explain the concepts of constructivism and constructionism and how they relate to Charmaz's version of grounded theory.

3.4.3 Constructivism and constructionism

Constructivism and constructionism are two similar but different concepts. In a constructivist paradigm, meaning is constructed by an individual rather than discovered (Charmaz, 2006; Mills, et al., 2006b). Although constructionists also see meaning as constructed, they view it as *socially* constructed through interaction between individuals and the world around them. Lev Vygotsky, John Dewey and Jean Piaget are major theorists among social constructivists. A constructivist grounded theory approach is not unlike Vygotsky's (1978; 1986) sociocultural theory because it focuses on the experience of individuals in a common social context. He believed that knowledge is first constructed in a social context (interpsychological) and then internally by the individual (intrapsychological). Charmaz (2014, p. 14) states that her constructivism "aligns well" with the social constructivists including Vygotsky.

I am aware of the subtle differences between constructivism and constructionism. However, rather than focusing on these nuances, I see participants as both individual and social beings who must be understood in their natural setting or everyday contexts. In other words, I see meaning as constructed by individuals *and* by social interaction. I use the term "constructivist" more frequently because this is the term Charmaz chose for her version of grounded theory.

3.4.4 What is theory?

The concept of "theory" in grounded theory is contentious. Thomas and James (2006) assert that the term is confusing when used to describe what happens in qualitative research. They state that grounded theories help us to understand rather than explain. In comparison, Glaser and Strauss (1967) define theory as that which has explanatory or predictive ability and posit that two kinds of theories can be developed using grounded theory: substantive and formal. Substantive theories are more common and defined as "a theoretical interpretation or

explanation of a delimited problem in a particular area" (Charmaz, 2014, p. 344). In comparison, formal theory is "a theoretical rendering of a generic issue or process that cuts across several substantive areas of study" (p. 343). McCann and Clark (2003) explain that formal theories encompass a conceptual area of inquiry, an example being Charmaz's (1990) inquiry into the chronic illness experience.

Although Charmaz agrees with Glaser and Strauss that grounded theory produces substantive and formal theory, the definition of "theory" is debatable. In contrast to Glaser and Strauss, Charmaz (2006, p. 126) describes an alternative definition of theory which emphasises understanding rather than explanation (which echoes Thomas and James' (2006) interpretation of "theory"). According to this definition, theoretical understanding is viewed as abstract and interpretive, and interpretive theory requires imaginative understanding of the phenomenon (Charmaz, 2006). Although I chose a constructivist grounded theory approach, I was mindful of the various understandings of "theory" and I found that constructing theory required both analytical and imaginative thinking. I did not aim to produce generalisable theory from a high level of abstraction because the scope of the study was limited to the substantive area of the studied experience. Rather, the aim was to generate a substantive theory.

3.4.5 Capitalising on personal experience and co-construction

The role of the researcher in grounded theory is also debatable. In classic grounded theory researchers are observers of emerging theory whereas Charmaz sees them as co-creators of theory. Also debatable is whether the researcher can separate knowledge and experience from their research. I concur with Charmaz's (1990, p. 1170) view that:

> Rather than reflecting a tabula rasa [blank slate], grounded theorists bring to their studies the general perspectives of their disciplines, their own philosophical, theoretical, substantive, and methodological proclivities, their particular research interests, and their biographies.

While keeping an open mind is important, it seems impossible for any researcher's mind to be a blank slate because previous experience and preconceptions are unavoidable. Charmaz (2014, p. 229) states that "positivists try to keep their values out of their research to avoid contaminating the results". There is a vast difference between seeing prior experience as contaminating bias and seeing it as valuable insight. Strauss (1987, p. 11) refers to "experiential data", which includes the researcher's research background and personal

experiences stating, “mine your experience, there is potential gold there!”. Strauss and Charmaz recognise that grounded theorists bring their valuable personal experience (or “biographies”) to research and the constructivist grounded theory *capitalises* on both the researcher’s interaction with the data and the co-construction of theory in the researcher-participant partnership. The inclusion of the Research participants chapter in this thesis reflects this partnership. I also provide my own profile in the chapter to acknowledge my prior experience, presence and influence in the study.

3.5 GROUNDED THEORY APPLIED IN RELEVANT DISCIPLINES

This section outlines a range of relevant studies which use Glaserian, Straussian or constructivist grounded theory method. This includes Library and Information Science (LIS), health research and mobile use research. It also includes customised research designs in which researchers combine components from various versions of grounded theory in their research. Constructivist grounded theory has flexible guidelines which enables the researcher to design their study to suit the research problem. A flexible method with few procedural guidelines also meant that it was practical to learn from approaches and procedural detail in other relevant grounded theory studies.

3.5.1 Grounded theory in library and information science

Grounded theory methods have been applied across disciplines including the Library and Information Science (LIS). Ellis (1990) from the University of Sheffield was the first of a cohort of information studies researchers to use grounded theory in his doctoral research titled *The derivation model for information retrieval system design* (Mansourian, 2006). Other examples of widely accepted models and theories of information behaviour that have resulted from grounded theory are Mellon’s (1986) theory of Library anxiety and Ellis’ (1993) Model of information seeking. In comparison, Pace (2004, p. 359) studied the flow experience of web users and asserts that grounded theory “deals well with the complex network of concepts and relationships in a human-computer system”.

More recently, constructivist grounded theory has established a presence in the Library and Information Science (LIS) research space among a new cohort of researchers. From Queensland University of Technology (QUT), Harlan (2012) researched the information practices of teenage content creators, Davis (2015) studied the everyday information

experience of new mothers while Harland (2017) and Mulatiningsih (2017) studied the experience of library professionals in specific contexts.

Nguyen (2014) developed a participatory library model using Straussian grounded theory while Fraser-Arnott (2016, p. 34) focused on the professional identity experiences of Library and Information Science (LIS) graduates in non-library roles using Glaserian grounded theory in order "to capture a deep view of participants' experiences". Harland (2017, p. 67) investigated "processes" that the university librarian undertakes which ensure the relevance of their libraries to stakeholders. In comparison, Mulatiningsih (2017, p. 4) adopted constructivist grounded theory because she sought a "holistic viewpoint" of library professionals' experience of social media. In my study, constructivist grounded theory supports a deep, focused and holistic view of the studied experience.

3.5.2 Grounded theory in health research

All versions of grounded theory have an established history in the study of health experience (or more precisely, the illness experience) and dying. This tradition started in sociology with the founders of grounded theory in *Awareness of dying* and *Time for dying* (Glaser & Strauss, 1965; 1968) and continued with Charmaz's (1990) *Discovering chronic illness: Using grounded theory* until the present day in nursing and other health-related research. Charmaz (1990) used the constructivist grounded theory method to study the experience of chronically ill people and how it affects their sense of self. She found that people developed preferred identities to construct lives not just defined by their illness (Charmaz, 1990).

Using a Glaserian approach, Mottram (2011) found that patients in two public hospitals in the United Kingdom experienced day surgery as a "McDonaldization" of healthcare as they were rushed through the system. In comparison, Wang (2007) used a Straussian approach to study the construction of meanings about non-Western medicine among Taiwanese people with cancer. Her core category was "taken-for-grantedness" which captured her Chinese participants' belief in the importance of traditional Chinese medicine. Harling and Turner (2012) state that grounded theory has a long tradition in nursing and health-related research which was a reason why they adopted the approach to study student nurses' attitudes to illicit drugs.

More recently, Charmaz collaborated in a constructivist grounded theory study about the experience of living with Parkinson's disease which built on her past research on the chronically ill (Vann-Ward, Morse, & Charmaz, 2017). While the illness experience is

insightful, my study focuses on health and wellness rather than the experience of illness. In accordance with the constructivist grounded theory approach, it was the role of the researcher and participant to co-construct the meaning of "health and wellness" which did not exclude illness.

3.5.3 Grounded theory in mobile use research

The grounded theory approach is suited to explicating complex processes and relationships and it has a history in mobile use research that predates the smartphone. In 2003, Blom and Monk followed Strauss and Corbin's (1990) approach to data collection and analysis to generate a theory of why users personalise their personal computers and mobile phones. They found that user, system and contextual dispositions lead to the personalisation of appearance (of personal computers and mobile phones) and this personalisation has cognitive, social and emotional effects on the user. More recently, Piper, Garcia, and Brewer (2016) adopted a constructivist grounded theory approach to their data analysis. In their study, they found that older adults (that is, people 80 years or older) face late life disabilities and require ongoing support to use mobile devices such as smartphones, tablet computers and e-readers.

Walsh (2012) used a grounded theory approach to coding data in his study on mobile information literacy. (He did not mention which version). I discussed his findings in the preliminary literature review. Finally, Battard and Mangematin (2013) used an approach "inspired" by classic grounded theory to understand the uses of mobile technologies to integrate and segment roles. They found that the ways people use their mobile technologies often modify the boundaries between work and private life and thus, impact either sphere.

Having outlined a range of relevant studies and a rationale for choosing constructivist grounded theory as the overarching research method, I now discuss this study's research design and implementation.

3.6 RESEARCH DESIGN

This section outlines the practicalities of the research design which were guided by constructivist grounded theory. First, I present the participant cohort and detail my sampling and recruitment strategies. Second, I detail the rationale for data collection by interview as well as my interview approach and the development of the research instrument. Third, I detail the approach to data analysis. Fourth, I present a section on maintaining quality in grounded theory studies. I include ethical considerations before concluding the chapter.

The study included a total of twelve participants (four participants from the pilot study and eight participants from the main study). In keeping with best practice, I first conducted a pilot test of the method that included four participants. The pilot study was a time to test and fine-tune the research instrument, the recruitment approach and the interview process. Reflections on the pilot study and the development of the research instrument are available in Appendices A and B. These reflections informed the approach to the main study. Although I made a few minor changes, I included all participants as part of the one overall study.

3.6.1 The participants

The participants were a selection of adults who use their mobile devices for being informed about health and wellness. South East Queensland includes urban, suburban and regional areas. Hence, I chose this convenient location with a diverse and cosmopolitan population because I sought participants of varying age, gender, occupation and perspectives (see also "Sampling criteria" in this chapter). This study included a total of twelve participants: four participants in the pilot study and eight more participants in the main study. After considering the suitability of the data, I included all pilot study participants as part of the main study.

Table 3 following summarises details of the twelve participants including their age, gender, occupation, date of interview and duration of interview. Each participant was interviewed face-to-face at a mutually convenient time and location in Brisbane between February 2014 and March 2016 (inclusive). The average interview duration was approximately 40 minutes. All participants brought their mobile device/s to the interview and details of assigned participant pseudonyms, highest level of education, specific types of mobile devices as well as participant profiles are presented in Chapter 4: Research participants.

Table 3 Summary of participant interviews

No.	Age	Gender	Occupation	Date of interview	Duration
1	35	female	Teaching assistant (primary school)	February 18, 2014	42:01
2	33	female	Radiation therapist	March 5, 2014	50:46
3	36	female	Project and account manager	July 13, 2014	48:28
4	42	male	Commercial airline pilot	July 19, 2014	36:15
5	29	male	Engineer	August 2, 2015	44:36
6	26	female	Administration	August 30, 2015	26:03
7	61	female	Director of co-curricular activities (at a secondary school)	November 22, 2015	51:34
8	63	male	Principal team leader (architecture)	February 4, 2016	44:34
9	37	female	Principal research officer (at a government department)	March 3, 2016	27:07
10	20	female	Student (university)	March 9, 2016	20:13
11	47	female	Independent consultant	March 10, 2016	38:06
12	44	male	Chief operating officer/Student (university)	March 21, 2016	29:52

3.6.2 Sampling and recruitment

Grounded theory involves initial sampling criteria and theoretical sampling. Establishing initial sampling is a starting point whereas theoretical sampling directs the study (Charmaz, 2014). Theoretical sampling, discussed later in this chapter, is a method of collecting, coding and analysing pertinent data for the development of emerging theoretical categories (Charmaz, 2014). I established initial sampling criteria according to Morse's (2007) simply stated principles. In her chapter on sampling in grounded theory, she states that all qualitative sampling is dependent on three principles which I address in the following paragraphs.

Principle 1: Excellent research skills are essential for obtaining good data

Morse (2007) states that excellent research skills include the ability to hear a storyline and adjust questions (and sampling) to yield good data. I believe that small talk pre-interview was a valuable skill (which I discuss in section 3.6.4 Approach to data collection by interview). Glaser (2009) asserts that inexperience has advantages when it comes to openness of ideas and I understood that openness and respect for participants were also excellent qualities in a researcher. As Charmaz (2014) cautions, obtaining rich data also means not undermining or demeaning participants.

Principle 2: It is necessary to locate "excellent" participants to obtain excellent data

"An excellent participant for grounded theory is one who has been through, or observed, the experience under investigation" (Morse, 2007, p. 231). They must be volunteers willing to be interviewed and be reflective and articulate. I considered participants to be excellent because of their recent use of mobile devices for health and wellness rather than their technological or health expertise. Participants were also generous about sharing personal (and sometimes sensitive) health and wellness concerns which also provided excellent data.

Principle 3: Sampling techniques must be targeted and efficient

"Qualitative sampling often begins by recruiting participants solely based on whether they have experienced the research topic in question" (Morse, 2007, p. 232). Initially, this simply involved asking people I knew whether they used their mobile devices for health and wellness. Charmaz (2014, p. 23) devotes a chapter to "gathering rich data" in which she defines rich data as "detailed, focused, and full". Glaser (1978, p. 45) recommends that in the initial stages of a study, the researcher needs to find "a rich supply of data". I found that talking to people directly in a friendly manner was the most efficient way of ascertaining their potential excellence as participants.

3.6.2.1 Sampling criteria

The sampling criteria required each participant to be 18 years or older, identify themselves as a mobile device user, recall using their mobile device/s for health information in the last two weeks prior to the interview, and be willing and able to chat in a face-to-face interview in South East Queensland. I did not include people familiar with information studies research because I thought that their theoretical knowledge might impact their account of everyday information experience. I now provide an explanation and rationale for the four sampling criteria.

Be 18 years or older

I sought a diverse range of adult participants because I did not want to limit my study to a certain gender, age group, or profession. I believe I succeeded in recruiting a diverse range of adults with diverse experiences of the phenomenon as demonstrated in Chapter 4: Research participants and in the research findings chapters.

Identify themselves as a mobile device user

I sought people who identified themselves as a mobile device user. In this study, a mobile device is defined as "a handheld computing device, such as a smartphone or a tablet" (Short & Uzochukwu, 2018, p. 194). Although this includes smartphones and tablet computers, the definition was not limited to these examples. For the purposes of this study, a mobile device user refers to a person involved in any activity using their personal mobile device/s. There is no generic definition of the term "mobile device user". I left it to participants to define what they considered to be "use" on their mobile devices. In comparison, Kassab and Yuan (2013) required that participants had a mobile data plan and were familiar with the mobile Internet. In my study, Internet connectivity was a feature of all participants' mobile device use.

Since partnership and co-construction were crucial, participants also needed to be reflective conversationalists. I reasoned that being willing and able to converse for approximately 30 minutes or more in an interview was a reasonable indication that the participant was reflective.

Recall using their mobile device/s for health information in the last two weeks

A further criterion for recruitment was that the participant could recall using their mobile device for health information in the two weeks prior to the interview. I considered this to be a reasonable timeframe for recent use and I thought that the details of recent use would be easier to recall. The definition of health and wellness was used broadly and left to the participants (and the researcher) to construct its meaning. To clarify, I did not require participants to be active in a sporting sense because my study was not a focus on sports. I also did not exclude or discourage people who were involved in sport.

Be willing and able to chat in a face-to-face interview in South East Queensland

The face-to-face (in-person) requirement of my sampling criteria meant that it was practical to recruit people who were geographically close.

In summary, all participants were "excellent" because they met the sampling criteria. This was paramount in this study because the number of participants was modest. At no point in this study was sampling intended to be random or representative of the user population. Rather, I sought diverse perspectives of the phenomenon as well as practicality in my recruitment. Morse (2007, p. 234) states that using random sampling to prevent bias has the opposite effect because bias is introduced by "not attending to the meaningful scope of the phenomenon".

Based on the initial sampling criteria, I began recruiting from existing contacts using a combination of purposive and convenience sampling (with the expectation that further participants would be recruited for theoretical sampling at some point in the main study). Not all people I approached agreed to participate. Several people declined (both males and females of various ages) because they did not use their mobile device for health and wellness, or they felt uncomfortable about being interviewed.

Recruiting existing contacts presents clear advantages such as trust and rapport. Gunton, Bruce, and Stoodley (2012, p. 122) found in their study of information literacy in church communities that "because the interviewer was known to the participants and is involved in the community, she enjoyed the confidence of participants". Trust and confidence were important qualities in a study about health and wellness that relied on a researcher-participant relationship. Most participants knew me and were comfortable with the idea of being interviewed. However, I was not familiar with the health status or mobile use of anyone apart from Nikita's (Participant 1) fondness for text messaging.

Prior to the interview, I requested via e-mail that participants bring their mobile device/s to the interview (which they all did) to prompt their memory and demonstrate use when appropriate. On the interview day, participants signed the consent form and completed the pre-interview questionnaire titled "Participant profile questions" (see Appendix G: Participant profile questions) designed to collect basic demographic information. I informed participants of ethics via e-mail and in person before the interview. I sent the "Participant information and consent form" (see Appendix C: Participant information and consent form) via e-mail and informed them that I would bring a printout to sign at the interview along with a pre-interview questionnaire. This was for reasons of courtesy and convenience.

Following my supervisors' advice, I recruited the final four participants from the broader community by distributing printed flyers and approaching people in my everyday life (see Appendix D: Recruitment flyer). As it turned out, I was only successful at recruiting people I

met face-to-face. The flyers simply helped me explain the study to people. For example, I recruited Shanna (Participant 11) from a charity event because she was interested in marathon running with her smartwatch and she was helpful by nature.

This study included a total of twelve participants: four participants in the pilot study and eight participants in the main study. In terms of sampling size, in a qualitative doctoral study of this kind, it is typical to include 11 to 20 participants. Grounded theory examples include Harlan (2012); Davis (2015); Talip (2016); and Harland (2017) who included 11 participants in their respective studies; Miller (2014) who selected 14 participants; and Lakshminarayanan (2010) who recruited 24 participants. The sample size in grounded theory is not pre-determined. Rather, it is based on how many participants are required to reach theoretical saturation. Likewise, Lincoln and Guba (1985, p. 202) suggest that the foremost criterion of sample size is redundancy of information in qualitative research.

3.6.3 The research instrument and probe questions

I developed the research instrument with the primary purpose of generating data in interviews. Ideally, interviews enable participants to describe their experiences of the phenomenon in their own words which generates data for the research study. Hence, the design of the research instrument is pivotal to the research study.

To test and refine the research instrument, the probe questions and the interview approach, I conducted a pilot study. I consider the researcher to be the primary research instrument, so I was also refining my skills at interviewing (see Appendix A: Pilot study reflections and Appendix B: Developing the research instrument).

In the main study, the interview questions included the single, open-ended question research instrument and the flexible probe questions to explore points as they emerged (which are detailed later in this section). Mansourian (2006) recommends designing interview questions as openly as possible to let the participant answer freely.

I started each interview in the main study with the research instrument:

> Can you tell me how you use your mobile device (e.g. smartphone, computer tablet) for health and wellness?

The following questions are illustrative of the type of probe questions used in interviews. Every effort was made to ask the questions in a natural unobtrusive way. Thus, I had no

particular order for asking questions and some questions were omitted while other new questions arose depending on the conversation. General probe questions included:

- Can you explain that further?
- Could you tell me more about that?
- What do you mean by that?
- Why is that important?
- Could you please give me an example?

I also asked general probe questions about each participant's history of mobile use if it did not arise in conversation. Charmaz (2009) explains that constructivist grounded theory examines historical locations and social circumstances. These kinds of questions prompted more reflection and conversation. Examples of background probe questions included:

- How do you know how to use your mobile device/s?
- What did you use (for health information) before you had your mobile device/s?

"For health information" was only included in the question above if a participant was unsure how to respond. The research instrument was a single question and the list of probe questions was short which effectively kept the interview informal and conversational.

3.6.4 Approach to data collection by interview

I reasoned that interviews were the best way to address the research problem which investigates people's information experience. Charmaz (2014, p. 56) explains that interviewing is a way of generating data for qualitative research "that explores research participants' perspective on their personal experience with the research topic". This was precisely my aim. Interviews are the primary form of data collection among grounded theorists. Although critics argue that interviews are performances that may not represent authentic experiences, Charmaz (2014, p. 71) sees research interviews as "contextual and negotiated".

I chose face-to-face interviews because of the interpersonal nature of this study in which I viewed my participants as people and partners. The semi-structured interview is a data collection method in qualitative research in which the researcher asks participants planned, yet open-ended questions. Galletta (2013, p. 2) states that the semi-structured interview

"creates openings for a narrative to unfold, while also including questions informed by theory". Semi-structured interviews also "allow for the exploration of lived experience as narrated in the interview" (Galletta, 2013, p. 9). Observation was another way of gathering data during the interview, and I often recorded my impressions in memos. The founders of grounded theory, Glaser and Strauss, used observations and interviews in their work leading to *The Discovery of grounded theory* in 1967.

Having discussed my rationale for choosing data collection by interview, I now discuss my approach to semi-structured, in-depth, face-to-face interviews. From a constructivist viewpoint, the interview is a co-construction between researcher and participant. At an interpersonal level, I was mindful that the nature of health and wellness is inherently personal and a potentially sensitive topic. Therefore, I found that small talk about mobile device features and models was an amiable approach. It was an interesting, informal way to start the conversation before the audio recording began. Miles (Participant 5) suggested that I switch my mobile devices to airplane mode to prevent disruption to audio recordings if someone tried to call me during the interview. I followed his sound advice. Miles told me during the interview that "I like talking about this kind of stuff", meaning mobile devices and health and fitness. We both found the interview conversation to be interesting and amiable. This is consistent with Kvale's (1984) observation that:

> the act of talking with another person who shares a common interest, is genuinely interested in your viewpoint, and who is not critical can be a richly rewarding experience (cited in Corbin & Morse, 2003, p. 339).

Charmaz (2006, p. 29) states that the "first question may suffice for the whole interview if stories tumble out", which was an accurate description of most interviews in this study. The rationale for starting with one open-ended question (the research instrument in my study) was to establish a foundation and the study became more focused as categories developed. The open-ended question was also designed to orient the participant to the research topic. I asked interview questions in a natural or organic order rather than their order in the interview guide (see Appendix E: Interview guide). As Glaser (2001) points out, this variation in interview questions is different to qualitative data methods which use uniform questioning.

Participants often responded to the open-ended questions with what they considered to be most important. For example, Richard (Participant 4) summarised his experience of the research topic by saying that he used his mobile devices in two main ways with mobile apps. The first way he mentioned was exercising and the second was monitoring his diet. Richard's

first response was very structured and succinct because the interview revolved around his experience of these two main ways. Although he summarised his experience in two significant actions in his first response, his experience was complex and entailed the synthesis or integration of many types of information (which are presented in the findings chapters).

If a participant discussed sensitive or uncomfortable health issues, I tried to focus on the information experience rather than the health condition. I nodded often to encourage participants to continue talking and reassured participants that they could talk about anything that they considered to be health and wellness. Two participants commented that the concept of health and wellness in the study was broader than they anticipated (Dee, Participant 3 and Reg, Participant 8). I was respectful of participants' views and, although I sometimes inadvertently interrupted or asked for clarification, I did not attempt to correct them because I considered them to be experts in their own experience of the phenomenon. As Charmaz (2014, p. 71) states, "establish equality not authority". I was also genuinely curious about their views and encouraged them to follow their personal interests in conversation.

Observation was an important part of each interview. Although I chose interviews as my primary data collection method, I was also mindful of Charmaz's (2014, p. 29) view that "everything you learn in the research setting(s) or about your research topic can serve as data". Hence, I wrote a memo after each interview to capture my thoughts and feelings which may not have been expressed in words in the audio recordings. For example, Amelia (Participant 9) brought her toddler with her to the interview which influenced our discussion and interaction. She had to balance her attention between the two of us and I felt conscious of taking up her time (more so than any other participant). When Amelia used her smartphone to show me how she used it for health and wellness, she did so discreetly. She later explained that her tablet computer was "too much of a toy" because her toddler tried to grab it. In comparison, if Amelia needed "a really quick bit of information", she could look at her phone and put it away. Both conversation *and* observation of interview situations can provide insight into participants' worlds.

Towards the end of each interview, I asked what Charmaz (2014, p. 67) calls an "ending question" which was designed to be the final open-ended question. I asked the participant if they had any questions for me. Several participants asked about the research (including if I needed more participants) whereas others were content to end the interview.

3.6.5 Audio recording and transcription

For effective data analysis, it was necessary to audio record interviews for transcription. Interviews were recorded with the participants' consent. I used two audio recorders for each interview to minimise the risk of losing recorded content due to technical failure (my smartphone voice memos and a voice recording app called Recorder Plus on my tablet computer). I noted that Lloyd (2014) also used an iPad for audio recording interviews. The audio recordings were of reasonable quality. I could distinguish each participant's voice and only a few words were indecipherable, usually because the interview venue was a busy café.

I manually transcribed each interview recording verbatim into typed transcripts. The act of transcribing prompted further reflection about the interview process and content which were subsequently recorded in memos. Although time consuming, this promoted intimacy with the data. Further details about audio recording and transcription are available in Appendix A: Pilot study reflections.

3.7 DATA ANALYSIS

This section outlines my approach to data analysis. According to Charmaz (2008, p. 167), "the four grounded theory strategies of coding, memo writing, theoretical sampling and theoretical saturation form the defining features of the method". This section outlines my approach to the four strategies as well as an outline of the data analysis software I used (NVivo 11 and 12). Although I outline these features in sections, they were not separate, distinct phases. Data analysis and collection occurred concurrently, and coding was iterative. Charmaz provides flexible guidelines for collecting and analysing data however, because she provides scant procedural detail, I also referred to the work of other grounded theorists and Saldaña's (2009) coding manual. I concur with Glaser (2010, p. 13) that grounded theory is an "adopt-and-adapt" method, especially in relation to data analysis.

3.7.1 Coding

Coding is common in qualitative research and was fundamental to data analysis in this study. In constructivist grounded theory, the researcher *constructs* codes. Charmaz defines coding as "categorizing segments of data with a short name that simultaneously summarizes and accounts for each piece of data" (2014, p. 111). She sees codes as the bones of the analysis while theorising integrates these bones into a working skeleton (p. 113). More simply, Strauss (1987, p. 20) defines coding as the general term for conceptualising data.

I used a combination of coding methods in two main coding phases which I explain in the next section. Saldaña (2009) emphasises that the coding method needs to harmonise with the nature and goals of the research study and that one coding method alone may suffice, or that two or more may be needed to capture the phenomena in the data. Both he and grounded theorists identify at least two phases of substantive coding whereas Strauss and Corbin's (1990) approach entails three (that is, open, axial, and selective coding phases). Researchers use different labels to describe these coding stages. Classic grounded theory refers to *open* and *selective* coding, Charmaz refers to the phases as *initial* and *focused* while Saldaña refers to them as *first cycle* and *second cycle* coding methods. Although I mostly use Charmaz's labels because constructivist grounded theory is this study's overarching method, I see that "initial" coding entails being open-minded and is the first cycle or phase before "focused" coding. On reflection, the coding process was highly iterative which meant that the codes (initial and focused) were continually changing, and open-mindedness was required throughout the entire research study.

3.7.1.1 Initial coding

My primary coding method was gerund coding (alternatively known as action coding). This entails the use of action verbs (that is, words ending with "ing") to prompt thinking about participant actions and sequence from their perspective. During the initial coding phase, Charmaz (2006, p. 49) recommends coding with "gerunds", a technique originating from Glaser (1978). She explains that "adopting gerunds fosters theoretical sensitivity because these words nudge us out of static topics and into enacted processes" (2014, p. 245). Note that I interpret "action" as any incident or experience, not just *active* action. For example, many gerunds involved "observing" and "feeling". I aimed to construct a code for each "action" which helped me see enacted processes (more so at a later stage rather than while constructing the initial codes).

Theoretical sensitivity is the researcher's "level of insight into the research area" (Mills et al., 2006b, p. 28). Historically, grounded theorists in sociology referred to their professional experience for theoretical sensitivity. In my case, I also referred to my everyday life experience because of the everyday life context. I also understood that theoretical sensitivity developed through interacting with participants and data throughout the study as well as with related literature towards the end of the study. Charmaz (2014) sees theoretical sensitivity as the ability to understand and define phenomena in abstract terms and discern meanings in emerging patterns. "Coding not only fragments your data, through coding you also learn what

forms these data and in which theoretical directions you can take them" (Charmaz, 2014, p. 161).

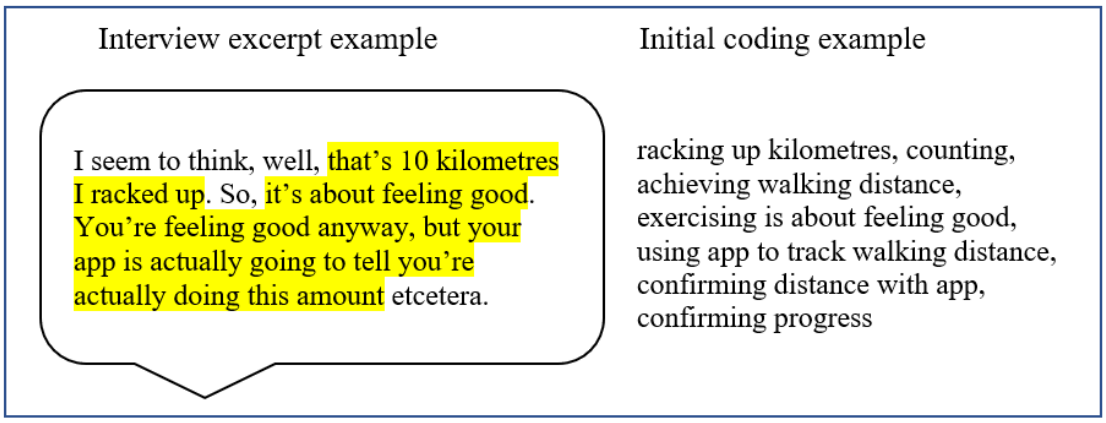
Coding helped identify emerging concepts (or theoretical directions) for further exploration. I also identified emerging patterns in gerunds. For example, participants' actions frequently involved observing and feeling. Although gerund (action) coding was good for identifying enacted processes, I found that it could also be limiting and encouraged awkward codes at times. I tried to avoid "using" because I felt that it was not very descriptive. I also avoided codes with the nebulous gerund "experiencing" because this study investigated information experience and "experiencing" has a myriad of meanings. "Experiencing constant connectivity" was an exception because it was the best way to describe something that was more a feeling of social closeness and a psychological awareness than an action.

I also used *in vivo* coding to reflect the words and meanings of my participants. *In vivo* coding focuses on participant language or special terms and Charmaz (2006, p. 55) sees these special terms as characteristic of social worlds that can reveal a participant's fresh perspective. Several participants used special terms. For example, Shanna (Participant 11) explained that her mobile devices were "dinging" and "zinging" at her. "Feeling that mobile devices are dinging at you" was both a gerund and an *in vivo* code. The fact that Shanna said "at you" was significant because it represented her perspective in a concise way. These simple terms conveyed the clamouring intrusion she felt in her everyday life and I wanted to capture them *in vivo*.

Typically, qualitative researchers code for topics word by word, line by line or paragraph by paragraph. Saldaña (2009, p. 3) states that "the portion of data to be coded during First Cycle coding processes can range in magnitude from a single word to a full sentence to an entire page of text". In practice, I mostly coded line by line and later paragraph by paragraph because this study was exploratory in nature and I was trying to discern what participants considered to be information and the ways they experienced it. Identifying actions in segments of data helped reveal information actions as well as many other associated actions for further exploration.

Before uploading interview transcripts to NVivo data analysis software, I read through printouts. Figure 1 is indicative of my initial coding of transcripts on printed transcripts. On the left is an excerpt from the interview with Reg (Participant 8). I used a highlighter pen to choose words or phrases from the interview that seemed significant and then wrote my initial thoughts and codes (that appear to the right).

Figure 1 Example of initial coding on paper



In Reg's example, I noticed that he was informed by feelings and his app. "Racking up" was part of tracking and feeling good was integral. If I wanted to be pedantic, I could have coded "etcetera". I did find that participants were selective about using the many features and functions of the mobile devices. The "etcetera" indicated that Reg was aware of more information available on his app. I was not overly pedantic (in this instance) because I had already noted that Reg looked at his app during the interview to read out the complicated features available such as "circle muscular quality" that he chose not to use because he did not want to be "obsessive" about it. Likewise, I did not want to be obsessive about coding.

My natural tendency was toward "lumping" rather than "splitting" the data (which I noted in a memo in 2015 when I was introduced to the idea. See Appendix F: Memo sample). "Lumping" and "splitting" are terms used to describe the conceptual coding of relatively large lumps of data or relatively small segments of data respectively (Bazeley & Jackson, 2013, p. 143). Alternatively, Saldaña (2009, p.19) refers to lumper coding as broad brush-stroke representation of data or holistic coding. He states that both lumping and splitting have their advantages and disadvantages (p. 20). Personally, I found excessive splitting at such an early stage to be overwhelming.

Initial coding was very time-consuming because it entailed action coding large volumes of data from transcripts which involved many choices. My priority was to code thoroughly and meaningfully, but I found it difficult to summarise each piece of data with a short name (which is Charmaz's definition of coding) because, often, each action or experience required more explanation than a short name. Similarly, Saldaña (2009, p. 3) states that the short name should be "essence-capturing". I agreed with this approach but found it difficult in practice because many actions were complicated and lacked meaning when fragmented from their context (and splitting rather than lumping data exacerbated this). I found that essence-

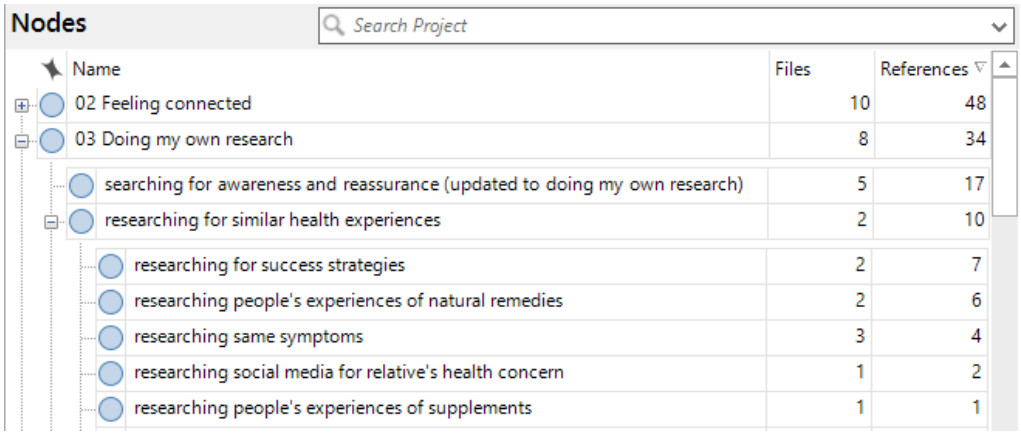
capturing coding was particularly difficult, probably because information experience is so context-dependent.

My attempts at essence-capturing coding were challenged further by "speed and spontaneity" which is what Charmaz (2006, p. 48) recommends for initial coding. I accepted that my initial codes were just "initial" (that is, tentative or provisional) fragments and that they would make more sense later in a working skeleton. Also, I did not want to over-code or what Saldaña (2009, p. 47) calls "muddying the analytic waters" by using too many coding methods or constructing too many codes (by the end of the study I had almost 1000 codes). Time-consuming coding provided the bone fragments of my analysis while writing memos and writing research findings were major ways of reconstructing these fragments into meaningful skeletal structures, that is, tentative categories and eventually theory.

3.7.1.2 Focused coding

After initial coding of interview transcripts, I followed Charmaz's approach to focused coding which entails comparing and identifying the most frequent and significant codes. NVivo data analysis software displays the number of "references" to each code which allowed me to sort by either ascending or descending reference frequency (see Figure 2) or sort alphabetically by code "name". This was a useful feature for identifying frequent codes.

Figure 2 Screenshot of codes by descending frequency in Nvivo



Comparing codes also enabled me to standardise gerunds and remove duplicate terms which resulted in a more controlled coding vocabulary. For example, I decided to use the gerund "searching" for "browsing", "seeking" or "looking" online via a mobile device. Later I decided to distinguish between "researching" and "browsing" which required what Charmaz (2006, p. 71) refers to as "fresh coding" or recoding for clarity. Saldaña (2009, p. 10) refers to both recoding and recategorising because "rarely will anyone get coding right the first time".

A more controlled vocabulary made it easier to see frequent codes by simply observing the number of codes displayed in NVivo.

Deciding which codes were *significant* codes required a more nuanced approach because I had to interpret what participants considered important. Charmaz (2014, p. 145) states that a code does not need to be frequent to be significant or "telling". I interpreted "telling" to mean that the code revealed something particularly significant about the phenomenon. I constructed the code "updating via walkie-talkie" because Zoe (Participant 10) used the term "walkie-talkie" to describe how she communicated via smartphone with her friends. This code was unique and telling and became an aspect in a category. Participants often experienced the phenomenon in unique ways. It was my role to see how these ways might fit together conceptually. As part of focused coding, my supervisors encouraged me to account for each initial code. In other words, to work out how each initial code fitted conceptually into focused coding and to ensure that no orphan codes were left behind.

I later learned about "magnitude coding" which indicates intensity or importance in a qualitative study (Saldaña, 2009). Generally, it made sense that the *frequency* or *intensity* of an action strongly indicated *significance* from my participants' perspective. For example, intensity was characterised by a strong personal stance. Ella (Participant 2) felt strongly about natural foods and Richard (Participant 4) was intent on losing weight privately. I coded these under "knowing my preferences" which was both a frequent *and* significant focused code. When writing my categories, I realised that Ella took a strong stance based on her beliefs. Although I did not capture this essence in coding, constant comparison revealed these important information experiences when comparing categories and writing findings. I found that like initial codes, focused codes could also be tentative or provisional as ideas and new connections kept emerging. "Grounded theory depends on constant comparative methods *and* your engagement" (Charmaz, 2006, p. 178). I am not sure how any researcher could code the large amount of data in a qualitative, grounded theory study meaningfully without engagement and endurance.

In her chapter on "Theoretical sampling, saturation and sorting", Charmaz (2014, p. 209) suggests recoding earlier data "when stuck" without explicitly stating that this is a way of theoretical sampling. It is unclear whether Charmaz considers the recoding of existing data as a way of theoretical sampling or not. Nevertheless, whether it is labelled as theoretical sampling or not, the act of re-examining and recoding was useful to refining concepts and a section on theoretical sampling follows later in this data analysis section.

3.7.2 Constructing categories and theory

My category construction relied on constant comparison which is an intensive data analysis technique in grounded theory. Comparing focused codes led to constructing tentative categories. I compared the tentative categories with the new data of transcribed interviews. Sometimes new data redefined a tentative category. For example, the tentative category "Feeling uncertain" became "Facing uncertainty" because I realised over time that participants were also facing or confronting their uncertainties about health and wellness.

Charmaz (2008, p. 164) states that:

> grounded theorists scrutinize their focused codes to evaluate which ones best explain or interpret the empirical phenomenon. These codes then become tentative theoretical categories.

My frequent and significant codes contributed to tentative categories which involved scrutinising codes and categories over a long period of time (from 2014 to 2019) using the constant comparison technique, that is, verifying that the data supported the tentative categories. For example, "Knowing myself" was a logical tentative category because of the volume of focused codes relating to self-awareness and personal preferences. By "volume" I refer to quantity, intensity and magnitude. Towards the end of the study, I was still considering (scrutinising) whether "Caring for others" was a category because the caring sentiment behind information actions was obscured (or not adequately captured) by action coding. I knew that it was significant at least and my associate supervisor reminded me that "Being a mother" was a tentative category that did not become a category. Morse (2008) refers to a theme as a meaningful essence that runs through the data as opposed to a category which is a collection of similar data sorted into the same place. Her definition of a theme is an accurate description of caring in my study.

My frequent and significant codes were fragments and writing and theorising fleshed out the conceptual categories which I consider to be the body of my findings. Comparing categories helped me see the phenomenon from new angles which revealed how experience-rich and action-oriented it was. To reiterate, I interpret "action" as any incident or experience, not just *active* physical action. The grounded theory title *Going mobile for health and wellness* reflected participants' *active choice* to use their mobile devices for health and wellness.

Charmaz (2014, p. 245) does not provide specific guidelines on theorising, rather she asserts that it requires imagination, "whimsy and wonder". Initially, imagination, whimsy and

wonder seemed cavalier and at odds with an intensely analytical method such as grounded theory. However, Charmaz (2014) suggests that the acts involved in theorising encourage seeing possibilities from multiple vantage points and establishing connections. It sounds simple in hindsight, but it was not initially obvious that caring involved caring feelings and caring actions. Once I observed caring from different vantage points, I could visualise how it related to information experience. I think that theorising about caring involved scrutinising codes and visualising or conceptualising more than imagining.

I understood the role of imagination in grounded theory when it was explained a different way. "Grounded theory involves creativity and imagination disciplined by the processes of collecting, fractioning and coding, reassembling and connecting, representing and interpreting" (Pozzebon, Petrini, Bandeira de Mello, & Garreau, 2011, p. 190). The understanding that grounded theory entails *disciplined imagination* clarified the important role of whimsy and wonder in theorising. This discipline combined with imagination helped me conceptualise how all the data fragments might fit together in categories and be constructed as theory.

Theorising involved a great deal of constant comparison and the actual act of reaching theory was "complex and messy" (Saldaña, 2009, p. 11). Not only limited to coding, constant comparison continued when writing my findings because I continued to establish new connections. For example, when comparing incidents in quotes, I noticed that Richard (Participant 4) used the word "religiously" to describe how he used his apps and Liz (Participant 7) referred to a medical journal as her "Bible". These figures of speech suggested that ritual and personal beliefs were significant. This prompted me to think afresh and, as Charmaz (2014, p. 116) phrases it, interact with implicit meanings "again and again".

On reflection, "caring" and "beliefs" were more abstract concepts not captured well in gerund (action) coding because participants experienced them internally and action coding focuses on action. However, I think constant comparison and theoretical sensitivity rebalanced the focus, revealing this subtext. It was not only coding that enabled me to discern patterns but also the writing of findings which stimulated more observation and theorising. "The constant comparison method in grounded theory does not end with completion of your data analysis" (Charmaz, 2014, p. 305). Rather it continues with the literature review when grounded theorists compare their theory with evidence with other studies. I compare my theory to evidence in the literature in Chapter 7: Discussion and conclusion.

3.7.3 Memo writing

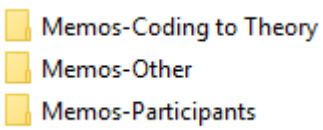
I wrote memos when reflecting on interviews, codes, categories and theory. Primarily, memos are written records of data analysis. Charmaz (2006; 2014) sees memos as a way of exploring developing conceptual categories and connections between categories while Birks and Mills (2011, p. 40) refer to memo writing as "the cornerstone of quality". Grounded theory memos are different to field notes because they are not only observations but also the researcher's reflections with a focus on "promptness and spontaneity" rather than perfect grammar (Mansourian, 2006, p. 392). McCann and Clark (2003, p. 15) state that memos "reflect the researcher's internal dialogue with the data at a point in time". I also found that *interpersonal* dialogue was helpful because a meaningful way to write memos was to write them as if typing a reflective e-mail intended for a research friend or supervisor.

My memos are a record of my inner dialogue as well as my interpersonal dialogue. They reveal how I related personally to the data and my thinking behind how the data related. Memos are also a way of recognising prior knowledge and how it relates to data. Charmaz (2006, p. 15) asserts that grounded theorists are "obligated to be reflexive" because the researcher is part of the constructed theory. When writing my findings, I found writing memos to be distracting because I was theorising and sense-making by writing directly into my findings. Consequently, I wrote fewer memos towards the end of the research study.

My memos had three main formats including Microsoft Word-typed memos filed in Windows filesystem folders, typed memos in NVivo, and spontaneously typed memos captured in e-mails on my mobile devices (smartphone and tablet computer). In the following, I explain these memo formats.

Early in my research study, I started typing my memos in Microsoft Word and filing them in my Windows filesystem folders. I filed my typed memos in three main folder groups as shown in Figure 3. Note that the first folder simply refers to my memos written from the first stage of initial coding to the construction of theory, that is, coding to theory.

Figure 3 Memo folders



My earlier memos included reflections from each participant interview (filed under the "Participants" folder), coding and tentative theory ideas (filed in the "Coding to Theory" folder) as well as singular, miscellaneous ideas that could be just a sentence or two (filed in the "Other" folder). My longest memo (filed in the "Coding to Theory" folder) is twelve pages long and much of it was integrated into my findings. This memo was an exploration of all the ways participants made sense of their experience in using mobile devices for health and wellness. Naturally, it was for my own sense-making purposes too.

In comparison, my typed memos in NVivo are brief notes that appear after the interview transcripts. These notes detailed pre and post interview conversations that were not audio recorded as well as other observations. During interviews, I observed actions and visual cues. Many of these observations were integrated into the participant and findings chapters.

As an alternative to using Microsoft Word, I also wrote (typed) memos to my supervisors and research friends as draft e-mails to myself if I had a mobile device in hand rather than pen and paper. This was a useful way of sense-making. Occasionally, I sent these e-mails and received return e-mails. Talip (2016, p. 107) also kept "brief notes on an iPhone to capture initial thoughts" in her constructivist grounded theory study.

Regrettably, I found cloud technology was alarmingly unreliable in its replication across devices and difficult to access from my mobile devices. If this technology was more reliable, I would not have used draft-e-mails and all my typed memos would have been integrated in my Windows filesystem folders at the time of typing. On reflection, it was better project management to store my memos in various formats.

3.7.4 Theoretical sampling

Theoretical sampling was part of my data collection and analysis process. It is a grounded theory principle that entails collecting, coding and analysing pertinent data for the development of emerging theoretical categories. Charmaz (2014, p. 200) sees it as a way of explaining "puzzling findings" in the early or later stages of the study. I understood that the researcher can start theoretical sampling when they have tentative categories to develop.

"Initial sampling in grounded theory is where you start, whereas theoretical sampling directs you where to go" (Charmaz, 2006, p. 100). She adds that "the logic of theoretical sampling distinguishes grounded theory from other types of qualitative inquiry" (2008, p. 167). This "logic" means that "participants are selected according to the descriptive needs of the

emerging concepts and theory. These needs dictate the sampling strategies and goals" (Morse, 2007, p. 235).

My theoretical sampling strategy was based on following emerging concepts at the time. After initial coding of transcripts from the pilot study, interview questions changed in response to developing theory. This was an incremental way of theoretical sampling throughout the main study rather than asking many questions toward the end of the study. When puzzling findings arose in the main study that suggested data were needed to build concepts, I found additional participants to refine concepts, I asked new interview questions and I returned to existing data to re-examine concepts.

Typically, I had a *concept* I wanted to clarify rather than prepared questions and I found this to be a more natural or organic way of interviewing. For example, I observed that participants preferred not to use telephone calls for health and wellness. Although participants cited several examples of audio-visual calls, they rarely mentioned using their mobile device for voice-only audio phone calls. Considering that all participants owned smartphones, I thought that this was odd and worth pursuing. When Charly (Participant 6) revealed that in daily life she does "a lot more messaging than phone calls", I probed further to understand why and gained insight into her complex communication practices. Charly finds telephone calls to be impractical for keeping on top of things and organising events. When I asked Liz (Participant 7) how she communicated with her mother long-distance before mobile devices, she said by telephone. However, she qualified this by stating that her elderly mother, who uses a tablet computer, "actually, almost prefers this now because she's at an age where she's starting to get, she gets tired talking on the phone". It was intriguing that Charly and Liz had very different reasons for *not* making telephone calls. Although, the phrasing and timing of my questions were different in these two examples, my attempt to grasp the heart of the concept was the same.

I also observed that participants used information from their mobile devices in various ways for amusement and to feel better, so I asked Shanna (Participant 11) if she used her mobile devices for "fun". She associated fun with games and said that only her children used her devices for fun. However, she was amused by the cheeky e-mails that her children sent which indicated that "fun" was not the right word in this context. It was very clear when I interviewed Aziz (Participant 12) that the *way* he interacted with people via his mobile device was also key. Rather than using the word "fun", I asked him if he used his mobile devices for "entertainment". He replied that he did not spend time watching videos and YouTube.

Apparently, the words “fun” and “entertainment” did not resonate with these participants (in this context). However, using these words in interview questions encouraged Shanna and Aziz to clarify what they did enjoy about the studied experience.

In comparison, towards the end of the study, I chose to return to existing data and re-examine it to see new perspectives and refine concepts. This was mostly for practical reasons because I relocated to the United States which made it difficult to recruit new participants from South East Queensland for face-to-face interviews. Also, my supervisors reassured me that I had enough data. The last two participants (Shanna and Aziz) reinforced, from their two unique perspectives, that caring in the studied experience entailed both technical and social connection. Caring was a theme in this study that cut across categories. Re-examining existing data revealed the complexities of caring in this study or what Tucker (1965, p. 159) refers to as “the nature of the situation”.

3.7.5 Theoretical saturation

Although I was guided by the concept of theoretical saturation, there are no specific guidelines on the amount of data required. Theoretical saturation occurs when no additional data can be found that would add to the theoretical category being evaluated. Conversely, when the researcher determines that theoretical saturation has occurred, they cease data analysis.

Theoretical saturation is a subjective term. Charmaz (2014, p. 337) recommends that “categories should cover a wide range of empirical observations”. Similarly, Urquart, Lehmann, and Myers (2010, p. 372) provide a simple definition of saturated categories, describing them as “well represented by many instances in the data”. I found this to be a practical guide and reasoned that each of my categories include many diverse properties or subcategories which I referred to as “aspects” because “properties” implies that they are waiting to be discovered rather than constructed. In summary, the categories of experience subsume all the important aspects of the studied experience. I consider the categories in this study to be theoretically saturated in accordance with the interpretations outlined in this section.

3.7.6 Data analysis software

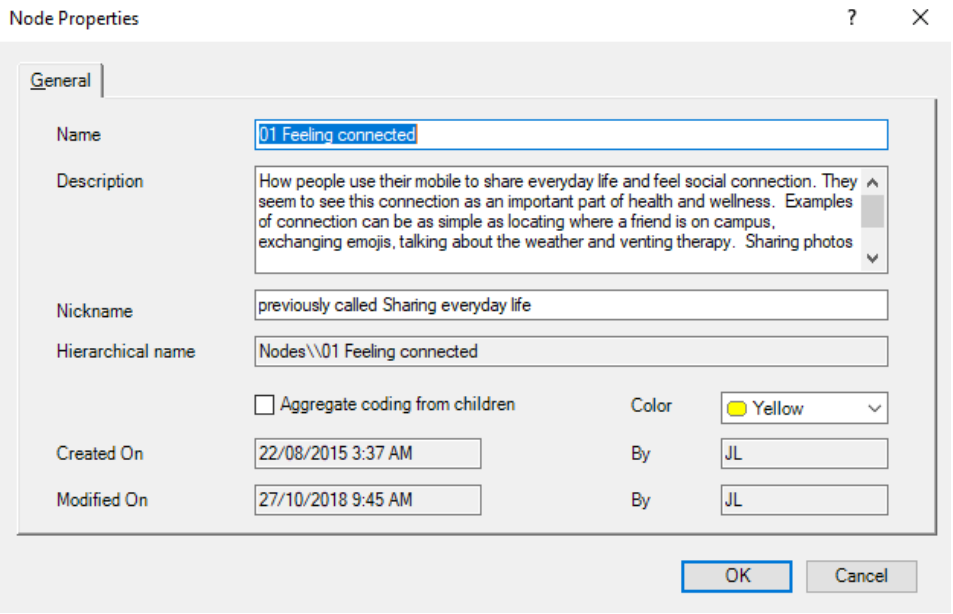
It was clear from my early efforts of data analysis that I required qualitative data analysis software to sort and compare data in a manageable way. I found that using a highlighter pen

on printed transcripts and using Microsoft Word comments to annotate soft copy transcripts was a starting point but inadequate for coding complex relationships in the data. I decided to use NVivo 11 software to assist with data analysis because it was supported by Queensland University of Technology (QUT). Disconcertingly, I was forced to upgrade to NVivo 12 towards the end of the research study. I never regained confidence at navigating the software because it looked different and I did not have the time to relearn.

I started initial coding in NVivo after uploading interview transcripts into the software. These initial codes were hyperlinked to the transcripts which meant that I could easily refer back to the transcript for context if required. NVivo is a data management and navigational tool that offers many features. I found it useful to sort codes alphabetically, by frequency (that is, by the number of "references") or by my assigned colour code which indicated frequent codes, significant codes and suggested emerging categories (to which I added a yellow colour code). I could also "un-code" (or undo codes) and change the code name easily. Also, by right clicking each code or category entry, I could add a description to the "Node Properties" which was a useful way of writing early draft categories descriptions because they were literally close to the data (a mouse-click away). "Node" is an NVivo term used to describe a container for data. For example, a node could be used for a code or a category.

Once I started writing my findings, I seldom returned to update these category descriptions, so they became more of a record of my thinking at the time. For example, below in Figure 4 is a screenshot of an NVivo "Node Properties" dialogue box depicting an emerging category description that I created in 2015. I assigned a yellow colour code to each emerging category and this one eventually became a category in my grounded theory. I used the "Nickname" space to note that it was previously called "Sharing everyday life" because it made sense to use this space.

Figure 4 Screenshot of emerging category description in NVivo



Although NVivo provided great assistance with data analysis, I was conscious that it was my role as a researcher to construct codes, categories and theory and that the software played a supporting role. Under a section titled "Technology entrapment", Holton (2007, p. 287) cautions that computer-assisted coding software programs are "counter-creative" to theoretical conceptualisation in grounded theory. Similarly, Charmaz (2006, p. 179) refers to "short-changing" the analytic process with software programs.

Although I did not feel trapped or short-changed, I felt that NVivo encouraged or influenced me to fit new data into existing codes because prompts would appear when I was coding. To counter this, I created a participant memo after each interview to outline my reflections before I started coding the transcript in NVivo and later, I typed an addendum to each participant memo after initial coding of their interview transcript to compare my reflections. I was aware that NVivo provided a section for memos, but I chose to keep my memos separate (and easily accessible from my mobile devices) with the exception of short spontaneous notes after transcripts if I was using NVivo at the time. Personally, I did not want to revolve all my data analysis around NVivo. It was not possible to install NVivo on my mobile devices and I preferred the comfort and convenience of reading and writing on my tablet computer.

3.8 MAINTAINING QUALITY IN GROUNDED THEORY

Grounded theory method aims to build theory rather than test or verify it. Personal experiences are subjective by nature. Therefore, rather than validating data, grounded theorists check interpretations as part of an ongoing process of constant comparative analysis. Data analysis in grounded theory includes memo writing which, ideally, counters researcher subjectivity. Seldén (2005, p. 115) states that grounded theory avoids the "trap of verification". As Pace (2004, p. 340) points out, Glaser and Strauss suggest that "if theory is grounded in data, then in some sense it has already been verified".

Like other qualitative research approaches, grounded theory is open to the possibility of misinterpretation or error. It is the researcher's role to choose a suitable methodology, describe the research process thoroughly, and follow it. Mansourian (2006, p. 386) states that the "credibility of each study highly depends on the suitability of the employed methodology with the research context". Similarly, Birks and Mills (2011, p. 36), state that:

> Methodological congruence occurs when there is accordance between your personal philosophical position, the stated aims of your research and the methodological approach you employ to achieve these aims.

In other words, a research study in which the methodology fits the researcher's worldview and addresses the research problem is more likely to be credible.

In this study, methodological congruence was carefully considered from the outset. An interpretivist approach aligns with my epistemological understanding that people construct (and co-construct) meaning. Schensul (2008) states that:

> interpretivist approaches focus on the meanings attributed to events, places, behaviors and interactions, people, and artifacts. These meanings have historical depth and are widely shared, negotiated, and co-constructed.

Charmaz's constructivist grounded theory approach aligns with my worldview (although, the term "constructionism" is also applicable because of the social nature of the phenomenon and the socially-derived meanings in this study). Attention to the research design (including methodological congruence) ensured the quality of this research study.

According to Charmaz (2014, p. 337), the criteria for grounded theory studies are *credibility*, *originality*, *resonance* and *usefulness*. While Mansourian (2006) asserts that methodological congruence supports credibility, Charmaz (2014, p. 337) states that the researcher's "intimate

familiarity" with the study topic is a means of achieving credibility which includes data that have suitable range, number and depth, systematic analytical comparisons and categories which cover a wide range of empirical observations. To obtain "excellent" data, I recruited "excellent" participants according to Morse's (2007, p. 231) Principle 2. (I outlined this strategy in section 3.6.2 Sampling and recruitment). The credibility of this research is demonstrated by the diverse range of "excellent" participants and the rich data collected in interviews. The findings presented in this study are the result of long-term engagement with the data, ongoing supervisory review and an intimate rendering of the topic under investigation.

Originality refers to the contribution of the research study to existing knowledge. No prior theory or research existed on the information experience in using mobile devices for health and wellness. This is why I aimed to develop my own grounded theory in this study. At the time of writing, scholarly works on information experience in general remain rare. The research findings in this study present new understanding of information experience as both an object of study and a research domain.

Resonance refers to the "fullness" of the studied experience and resonance is increased by a strong combination of credibility and originality (Charmaz, 2014, p. 337). My interpretation of both credibility and resonance is that they depend on how well a researcher listens to and conceptually renders participants' recounted experiences in the research findings. I believe that empathy and partnership with participants support intimate familiarity and the rendering of meaningful findings. Influenced by Weber's concept of *Verstehen,* Neuman (2006 cited in Gair 2012) observed that the uniqueness of interpretive social science research was rooted in the empathetic understanding of everyday lived experience. This suggests that the researcher's empathy supports understanding of experience and, therefore, the originality of their research. The categories of experience presented in Chapter 5 depict the fullness of experiences interpreted from the data. The object of study was a very human experience that required intimate attention to both people and data to be understood fully.

Charmaz (2014, p. 337) identifies usefulness as the final evaluation criterion. Grounded theory is pragmatically oriented in that it seeks to be useful and do social good (Seldén, 2005, p. 117). Following this tradition, I sought from the outset to develop a theory that was relatable and relevant to people in everyday life. Mobile devices are prevalent worldwide while health and wellness are of universal importance. My study gives voice to everyday health consumers who use their mobile devices outside healthcare for their self-care. I believe

that the resulting theory offers a considerable contribution to knowledge and also has practical implications which I outline in Chapter 7: Discussion and conclusion.

3.9 ETHICAL CONSIDERATIONS

I obtained full ethical clearance for this study from the Queensland University of Technology (QUT) Ethics Committee (QUT Ethics Approval Number 1400000018). In conformity with the approval, each participant was informed that they could withdraw at any time, and about complaint procedures regarding the conduct of the research. I informed participants of this prior to each interview via e-mail and in-person. This research followed standard procedure to ensure that participants' rights were protected during the research study. Once each participant was well-informed about the research and had agreed to be interviewed, they signed the Participant information and consent form (see Appendix C) and completed the Participant profile form designed to collect basic demographic information (see Appendix G).

3.10 CONCLUSION

In this chapter, I have presented the research methodology, research design and approach in this study. Constructivist grounded theory is the research method in this study for several reasons which I discussed in this chapter and summarise here. Constructivist grounded theory is congruent with my interpretivist worldview and is a systematic and enduring method for generating theory about a new phenomenon in new research space. Grounded theory is established in Library and Information Science (LIS) research, consumer health information research and mobile use research which makes it a logical fit with this study. I identified these three broad areas of research in my preliminary literature review chapter. Finally, the constructivist grounded theory approach, with its emphasis on the co-construction of meaning, provides rich and vivid insights into participants' experience of the phenomenon. In the next chapter, I introduce the research participants.

Chapter 4: Research participants

4.1 INTRODUCTION

Having presented the research methodology and approach in the previous chapter, in this chapter, I introduce the participants and present our personal profiles. A researcher-participant partnership is integral to the co-construction of meaning in the constructivist grounded theory approach (Charmaz, 2006; 2014; Mills et al., 2006). Charmaz (1990, p. 1170) recognises that the researcher brings valuable personal experience to their research which she calls "biographies". Although I met participants in separate interviews, the twelve participants and I co-constructed the meaning of the information experience in using mobile devices for health and wellness.

4.2 THE PARTICIPANTS

The research study included eight female and four male participants with ages ranging from 20 to 63. The average age was 39.4 and the most common participant profile was females in their thirties. Females expressed more concern about personal health concerns and health in general than males in this study. This partly explains why it was easier to recruit females for this research. Yates (2013, p. 62) also found that a considerably higher number of females expressed interest in participating in her health information literacy research. For females in my study with young children (that is, Nikita, Participant 1, Amelia, Participant 9, Shanna, Participant 11), motherhood and being a caregiver were defining roles which influenced their information experience.

All participants were ambulant and appeared to be in reasonably good health, however, Nikita (Participant 1) reported the she experienced chronic, unresolved pain. Nikita and Ella (Participant 2) are sisters who both had doubts about medical doctors because of their personal experiences. Six of the twelve participants pursued fitness with the support of their mobile device. Among the participants was a triathlete (Dee, Participant 3), a former elite athlete (Liz, Participant 7) and a marathoner (Shanna, Participant 11). Participants listed twelve different occupations. Being on call indefinitely for work strongly impacted two participants (Shanna, Participant 11 and Aziz, Participant 12).

Explaining participants' collective experience of the phenomenon required insight into each participant's individual experience. In the profiles, I present basic background information that includes participant age, occupation and mobile device types as well as personal expressions that capture each participant's experience of the phenomenon in their own words. I have assigned pseudonyms for anonymity and privacy because of the interpersonal nature of this study in which I viewed my participants as people and partners rather than mere data sources or numbers. Table 4 following summarises these participant profiles. The profiles appear after the table.

Table 4 Summary of participant profiles

No.	Pseudonym	Age	Gender	Occupation	Highest level of education	Mobile device/s
1	Nikita	35	female	Teaching assistant (primary school)	Certificate of Library Information & Cultural Services	smartphone; laptop
2	Ella	33	female	Radiation therapist	Bachelor's degree	smartphone; laptop
3	Dee	36	female	Project and account manager	Master of IT	smartphone; tablet computer; laptop; e-reader
4	Richard	42	male	Commercial airline pilot	Bachelor's degree	smartphone; tablet computer
5	Miles	29	male	Engineer	Bachelor's degree	smartphone; tablet computer
6	Charly	26	female	Administration	Year 12	smartphone
7	Liz	61	female	Director of co-curricular activities (at a secondary school)	Bachelor's degree	smartphone; tablet computer; wearable technology; e-reader
8	Reg	63	male	Principal team leader (architecture)	Post graduate diplomas	smartphone
9	Amelia	37	female	Principal research officer (at a government department)	Bachelor's degree	smartphone; tablet computer
10	Zoe	20	female	Student (university)	High school	smartphone; laptop
11	Shanna	47	female	Independent consultant	Year 10	smartphone; tablet computer; wearable technology
12	Aziz	44	male	Chief operating officer/Student (university)	Master's degree	smartphone; tablet computer; laptop

Nikita | Participant 1 | Mid-Thirties | Teaching assistant (primary school)

smartphone | laptop

Nikita has a history of chronic, unexplained pain which prompted her to seek alternative health options via her smartphone. In fact, this has become her preferred way of searching for health and wellness information. She tries "to steer clear" of disagreeable food as well as disagreeable aspects of mainstream health and connects with her close friends for emotional support. Generally, Nikita likens the human body to a car that needs the right fuel to perform well. Specifically, she tries "to steer clear" of food such as soy, suggesting that such foods are road obstacles to avoid.

Nikita is prolific in her text messaging, reflecting that she sends so many texts "that it's ridiculous". Text messaging her friends and family about life's ups and downs and ordinary moments is therapy and it is her ritual "to vent and then be able to get on with the day". Nikita vents frustration relating to health and motherhood in her daily life. Text messaging with her friends (including her sister Ella, Participant 2) provides a virtual space (or platform) for Nikita to express herself and be herself. Asked why she enjoys text messaging so much, she said, "because it's a bit more private when you've got little ears around that want to listen to everything you have to say". She was referring to her inquisitive primary school-aged son who listens to her spoken conversation with friends.

At the time of interview in 2014, Nikita and I we were in mobile contact because our children were classmates and we became friends. However, I was neither aware of her health concerns nor her mobile device use other than her preference for text messaging. At the time of writing, she lives in Brisbane while I reside in the United States. We text message each other most weeks. Nikita chose her pseudonym, the only participant to do so.

Ella | Participant 2 | Mid-Thirties | Radiation therapist

smartphone | laptop

As a radiation therapist, Ella is the only participant with an occupation in healthcare. She is versed in biology and biochemistry which is useful to her everyday health and wellness. She follows a nutritional discussion group to learn about other people's struggles and successes which she also refers to as a "journey". For Ella, it is "a support network" for people on the GAPS (Gut and Psychology Syndrome) diet and she will ask questions occasionally. She finds it interesting that everyone has a different "biochemistry makeup" and is interested in other people's health experiences in general.

Ella discusses her concerns about certain dietary supplements with her female friend. They typically exchange via email which includes "links to certain sites or about an article". She and her friend value each other's views and she told me that her friend:

> *tends to be more sceptical about things and she doesn't see how taking sometimes a supplement would work for her [whereas] I look at the biochemistry side of it and I think well yeah, this is going to be, this can change the enzyme that your body doesn't contain, so it's going to be that essential part in the pathway that's going to allow you to produce this hormone or, you know, nutrient or whatever* (Ella)

Ella described how she felt uninformed (or under informed) by her doctor and overwhelmed by information overload online. Frustratingly, her access to an excess of freely available information did not provide her with trustworthy, relevant information. She explained that when she had recurring sinus infections, her doctor provided neither remedy nor referral which made her feel forsaken. Disillusioned and feeling "left in the lurch", Ella started finding her "own way" by using her background in healthcare and her mobile devices to do her "own research". This includes researching the health concerns of her fiancée, sister (Nikita, Participant 1), nephew and mother.

She believes that humans and animals should be eating natural food and her creed and care extend to her pet dog whose image appears on her smartphone wallpaper. While Ella reports that her mother is a believer in modern medicine and her doctor's advice, Ella has her doubts after being left in the lurch by her doctor.

Dee | Participant 3 | Mid-Thirties | Project and accounts manager

smartphone | tablet computer | laptop | e-reader

Dee told me jovially that she has "too many devices" and that her mobile devices were always with her. For Dee, there is inspiration and solace in knowing more about her health concerns and, because she can "easily jump" on her mobile devices, she uses information for motivation, comfort or curiosity at her leisure on the go.

It was not unusual for participants to feel emotional when interacting with health and wellness information. However, Dee seemed particularly adept at using information to enhance and regulate her emotional experience. She uses information in various impactful ways to inspire, motivate, calm and reassure herself. Dee is a triathlete who literally and figuratively feels a buzz in her fitness training because her app gives her a haptic buzz to signal a change between slow and fast running in her interval training. She "kickstarts" or energises herself by reading fitness magazines. Dee also uses apps for sleep and relaxation and finds whale sounds to be soothing at night.

Dee has a family history of skin cancer, so feels "paranoid" about spots on her face. She found comfort in reading and seeing online information about the disease via her mobile devices. She also likes to "refresh" her knowledge of medical matters before a visit to the dermatologist to be "a bit more educated" during a typically short consultation.

Richard | Participant 4 | Early Forties | Commercial airline pilot

smartphone | tablet computer

As a commercial airline pilot, Richard is required to maintain a healthy body weight which propels his health and wellness pursuits. He revealed that a work medical was his initial motivation to lose weight, describing it as "a bit of a gee-up", which is synonymous with "giddy-up", a command used to encourage a horse to move or speed up. He also knows he needs "a bit of a poke and prod to get going" and spoke about "running around the paddock".

Richard told me that he was never a runner and never very fit. For this reason, he avoids sharing with others about his fitness unless he reaches a "milestone" and believes commercial weight loss programs can be a public display of failure. He prefers losing weight privately and, following his sister-in-law's advice to use certain apps, he manages his weight with his own app-assisted program of diet and exercise describing it as "like having your own background personal trainer".

Pre-interview, Richard told me that he loves his iPad and he also enjoys entering data into his apps during downtime. As a pilot, he spends a lot of downtime at airport terminals. Richard amuses himself updating his diet and exercise app. He feels no conflict between work and personal life settings during this lull and I understood that he found it relaxing "whiling away" the time. He also commented that:

> *the job I do you would think is fairly technologically advanced but it's always interesting when someone shows you a neat little feature or you show them a neat little feature on the device*. (Richard)

Miles | Participant 5 | Late Twenties | Engineer

smartphone | tablet computer

Miles is focused on fitness training because he knows that it makes him feel better in body and mind. He uses his smartphone for "fitness stuff" and life in general. Miles is not only motivated to organise but also organises himself for motivation. He told me that in the absence of his smartphone, he would be "in a terrible position" and questions how he would function. However, he has no affinity with his tablet computer because it's "awkward to hold" and won't fit in his pocket.

Miles relies on his gym as well as his smartphone to organise his fitness training. He said that his short-term goal is to be invited by the head coaches to join competition classes. For Miles, an invitation from these mentors is both a motivator and indicator of his fitness success. He is motivated and supported in a community that includes helpful coaches who are his trusted mentors. He learns from his coaches and logs his workout of the day in detail using an app.

Trigger point therapy involves treating myofascial pain by massaging certain points on the body. When Miles' coach suggested trigger point therapy, Miles was initially doubtful and thought it was "a bit strange". However, he generally listens to both his body and his coaches. He integrates information from these sources along with online sources. He showed me online trigger point charts on his smartphone that he uses to guide self-treatment. Miles trusts his smartphone for this kind of reference as well as for organising his fitness data. He also trusts his observations which are often visual and tactile in nature.

Charly | Participant 6 | Mid-Twenties | Administration

smartphone

Charly text messages on her smartphone for social connection and logistical arrangements such as meeting up with friends. She also exchanges messages with her friends about health concerns and, to a degree, trusts her own judgement.

Charly explained that she uses her smartphone for "friendship" with people she also sees in-person, elaborating that they "talk about everyday events". She considers instant messaging to be "talking" even though it is really typing and reading. Charly states that she instant messages her friends every hour because "[I] don't want to miss out on something". She is focused on friendship and wants to be kept in the loop.

Intrinsic to Charly's social connection is the drawing of social boundaries whereby she uses her smartphone apps and social media to define these virtual boundaries. She typically uses text messages (traditional Short Messaging System, SMS) for family and instant messages (Internet-based messaging) for friends. For acquaintances in her sporting social circle, she uses group chat to organise events. She redefined the boundary of her social circle by unfriending her ex-boyfriends on Facebook when the offline relationships ended. Charly segments her social networks based on different relationship domains.

Charly also uses her symptoms and pain (from netball injuries) to judge the seriousness of health concerns in tandem with online information. She Googles symptoms on her smartphone when she has a cold to know how serious it is before visiting a doctor. Trusting her judgment also includes knowing *when* to visit a doctor.

Liz | Participant 7 | Early Sixties | Director of co-curricular activities (at a secondary school)

smartphone | tablet computer | wearable technology | e-reader

Liz is active in body and mind as well as in her social networks which she describes as "a way of life". She is also interested in the latest health news and the latest mobile devices. Her tablet computer is particularly important to her and, when Liz's husband first bought his tablet, she felt that she should have one too. Exercising her body and mind are important to Liz and fitness has been a way of life for her since her formative years. She was an elite athlete and currently teaches physical education. She states that what motivates her to be healthy is feeling better and the prospect of longevity. She is conscious of her age because she uses the phrase "at my age" and comments that her children in their twenties "feel fairly infallible".

Liz uses wearable technology (that alerts her during the interview) but thinks it is "a bit of a novelty". Exercising her mind has become more important in her later years because she has observed "epidemic levels" of dementia in her social circle. She plays games such as Sudoku and Bridge on her tablet computer to keep her mind active.

To keep in touch with her 95-year-old mother who lives alone in New Zealand, Liz mostly uses her tablet computer. She and her siblings e-mail weekly photos of family to her and her mother views them on her own tablet computer.

As a secondary school teacher, Liz is concerned by what she calls "the click and go generation" which refers to how millennials use Google and Wikipedia for assignments and believe that everything on the Internet is "absolutely true and correct". She remembers as an undergraduate that "we literally lived at the library" and thinks that some value is lost in "instant" information.

Reg | Participant 8 | Early Sixties | Principal team leader (architecture)

smartphone

Reg is the oldest participant in this study, and he values the physical, mental and social aspects of health and wellness. He states that "at my age, life really feels too short", and uses this "in a positive way" to motivate himself to exercise and be active and enthusiastic. He is aware that the best way to bring his cholesterol down is exercise because his former workplace promoted men's health and provided regular testing.

Reg has sluggish days wherein he jokingly likens himself to a "sloth" (an extremely slow-moving animal). His fitness app confirms his walking efforts by counting his steps and these efforts are rewarded because, afterwards, he feels "ready to conquer the world".

Explaining his acceptance and adoption of mobile devices as a transition from "sceptic" to "a bit of a convert", he states that it eventually "struck" him that smartphones had many useful functions. For Reg, transitioning from sceptic to connected convert was a process and presently, connecting technically and socially contributes to his health and wellness.

Reg also values informal and personal news from his family via text messages which are often humorous. Previously, he thought that texting was a boring "yawn". However, at the time of interview, he was experiencing a temporary separation period from his wife and daughter who were living in Edinburgh for a few months. His wife was on a work assignment while he remained at home with his mother-in-law. During this time, Reg felt connected by the "expressive medium" of the text message. He identifies as a "Pom" (an English person) and enjoyed exchanging texts and emojis about the weather. He also sent reassuring text messages to his mother-in-law while he was at work and she was home alone. Although his mother-in-law was frustrated with the technology, she was determined to learn how to check the weather in Edinburgh on her tablet computer. So, Reg helped her.

Amelia | Participant 9 | Late Thirties | Principal research officer (at a government department)

smartphone | tablet computer

I met Amelia and her toddler-daughter at a busy, suburban café. Motherhood has impacted her life, and her health and wellness interests reflected this life change. Meeting mother and daughter in the café provided me with glimpses of their life. While chatting with me, Amelia handled her smartphone to prompt her memory as she sipped her coffee and whispered to her daughter not to touch her phone. She later said that her daughter takes up "about 99 per cent" of her attention and memory.

Asked how she uses her mobile device for health and wellness, Amelia replied that, "connecting me to other mums" was one way. She is a member of a private mothers' group on social media with members that she knows in-person. Amelia mentioned that the group had more frequent catch-ups when their children were newly born. Currently, she receives useful updates from an app she found on Google targeted at busy Australian mothers. The latest update detailed the developmental milestones of toilet training and putting clothes on with some help.

Amelia described how her focus was shifting to her own needs because her daughter was almost two years of age. She yearned for yoga classes and enjoyed browsing for new apps to try. She was also following another mother's blog on social media because they had similar digestive issues. The blogger was a trusted source because of her shared experience and like-mindedness rather than by qualification and Amelia enjoyed her "nurturing" recipes.

Amelia also sought nurturing social connections and felt distanced (or a disconnect) with her social media friends because she felt the need for "good connections" with people who were physically present rather than just "a photo". Amelia considered both good food and good social connections to be basic needs.

Zoe | Participant 10 | Early Twenties | Student (university)

smartphone | laptop

At twenty, Zoe is the youngest participant. I realised that the mobile phone as an invention had been present all her adult life. For health and wellness, Zoe primarily uses her smartphone for social connection with her friends and family in Brisbane and, less frequently, with friends and family in the United States.

In daily life, Zoe typically uses instant messaging for logistical arrangements such as locating and meeting her friends on campus. She can "exchange" and "just kind of update" her friends. Zoe also orientates herself with a free university smartphone app that contains searchable maps of her campus. When asked if she used her smartphone more for university life or personal life, she said that it was "pretty balanced". She also likes to follow recipes on her smartphone. For example, she makes sugar cookies for her mother's birthday each year and learned how to make sushi rolls and chai from her phone.

To her amusement, her primary school-aged sister uses Zoe's smartphone camera for her own personal use by snapping selfies, that is, taking "sneaky little photos" of herself for Zoe to find later. Zoe is from the millennial generation and, so too, is the self-expressive selfie.

Shanna | Participant 11 | Late Forties | Independent consultant

smartphone | tablet computer | wearable technology

Shanna prefers "peace and quiet" and "peace of mind" which can be conflicting preferences with the presence of mobile devices in her life. I understood that she experiences a bittersweet relationship with them. For Shanna, mobile devices are informing, connecting, reassuring, stressful and pressuring.

Often, there are no distinct geographic or temporal boundaries between Shanna's work as a travelling consultant and her personal life, largely because she uses her smartphone and tablet computer for both work and personal life. For Shanna, defining social contexts is difficult and she feels that her devices are demanding her attention. She viewed mobile connectivity as an intrusion that requires her to be constantly on call.

However, constant connectivity and immediacy are also comforting because she can contact her young school-aged sons and that provides "peace of mind". Also, she enjoys the spontaneity of snapping and sharing photographs with her camera apps and described her ritual of loading them on social media at night when she was in South Africa. Knowing the time zone difference, she cherished responses from her family and friends in the morning.

For health concerns, Shanna uses personal, internal information such as "a little niggle somewhere" (felt in her body) in tandem with online information via her mobile devices. She also uses wearable technology when training for marathons and is a member of a boot camp (fitness) group.

Aziz | Participant 12 | Mid-Forties | Chief operating officer/Student (university)

smartphone | tablet computer | laptop

For Aziz, using his mobile devices for health and wellness is mostly about "accessibility to everyone". Accessibility and connectivity are especially important to him because he manages his company in Sri Lanka while studying in Brisbane. His family and friends are far away and the divisions between family, friends and colleagues are fuzzy because he considers his friends to be family. Beyond the blurring of work, study and personal life settings, for Aziz, social connection is somewhat borderless.

Aziz feels present with his colleagues in Sri Lanka with social media describing it as the "easy way" to communicate with 300 staff. The quality and frequency of communication is important to him and he feels obliged to reply to staff members within an hour because it conveys the message that he is "worried about his or her wellbeing". Yet, Aziz did not reach for any of his mobile devices on the table during the interview because he was focused on our conversation. I believe that this demonstrated his good etiquette.

Besides the portability and connectivity of his mobile devices, he finds them appealing because they provide variability and newness. For this reason, he considers health apps and trackers to be "an utter waste of time" because, after a month, they provide little variability and newness. In contrast, the use of his smartphone and tablet computer provide variability in terms of application and content. He said that, if he writes a paper on his tablet, he is writing "something new" and his mobiles are also in hand to capture "good ideas" before they are forgotten.

Aziz also spoke about his "militarised way of working" and used the term "time boxing" to explain how he allocates time in his calendar to a single dedicated activity. He told me that his "life depends on this laptop" and, without his smartphone, he's "lost" and "gone" because he relies on it to organise himself and to connect with everyone.

Julie | Researcher in this study | Mid-Forties

Library and Information Science (LIS) researcher

smartphone | tablet computer | laptop

Together, the twelve participants and I co-constructed the meaning of the phenomenon in accordance with the constructivist grounded theory approach. I did not consider myself a participant in the sense that I was not interviewed (and for this reason, I did not include myself in the summary of participant profile table at the start of this chapter). However, my presence in the study, as both researcher and partner, was significant. Several personal interests inspired and influenced me to research the information experience in using mobile devices for health and wellness. Having presented abridged biographies of my participants relevant to the research topic, I now present my autobiographical profile.

Native to Brisbane, Australia, I was a librarian in special libraries in Sydney for many years before I returned and further developed my interest in Library and Information Science (LIS) research at Queensland University of Technology (QUT). Like my participants, I use my mobile devices for health and wellness information as well as for social connection with my family and friends. Thus, I was well positioned to relate to the participants in this study. Searching online for medical and alternative health information for my health concerns in the past, plus my experience with mobiles in general, provided greater understanding of my participants' experience.

Like my participants, I am not medically trained, so I rely on people and information to be trustworthy. In late 2017, this reliance intensified when we (as a family of four) relocated to the United States (from Brisbane) where there is no universal healthcare, where my local knowledge, personal experience and social connections are more meagre and, simultaneously, my consumer choices increased greatly.

In my daily life, I prefer my smartphone on the go and my intermediate-sized tablet computer at home because it is just right for reading and searching. I also have a laptop computer that is technically a mobile device, yet it is rarely mobile and rarely sits on my lap because it is unwieldy and because I have no affinity with it. Presently, I am using it to type this chapter and I also use it because it has data analysis software which cannot be installed on my preferred mobile devices. Throughout this study, I have neither lost interest in the research topic nor Charmaz's method. Meeting Kathy Charmaz twice at seminars during my research study renewed my enthusiasm for both. She was not only amiable and insightful about her

method but also respectful of Glaser and Strauss (that is, the founders of grounded theory). I agree that grounded theorists do grounded theory "in whatever way they understand it" (Charmaz, 2006, p. 148).

4.3 CONCLUSION

In this chapter, I have presented the profiles of my participants as well as my own profile. Each person revealed varied and valuable insights into the everyday human experience of the phenomenon. Together, we co-constructed the meaning of the studied experience which ultimately resulted in a substantive grounded theory. In the next chapter, I present the substantive grounded theory I co-constructed with the participants titled *Going mobile for health and wellness*.

Chapter 5: The theory of *Going mobile for health and wellness*

5.1 INTRODUCTION

In the previous chapter, I presented profiles of the participants in this study. This chapter responds to the question:

> What is the nature of people's information experiences in using mobile devices for health and wellness?

First, I present the theory developed through this study and explain the three major elements of the phenomenon. Second, I detail the five categories of experience which comprise the substantive grounded theory of *Going mobile for health and wellness*. The categories are unique and specific to the cohort and context in this research study and I consider them to be the main body of my findings. Third, I discuss the relationships between these categories.

5.2 *GOING MOBILE FOR HEALTH AND WELLNESS*

The theory developed through this study is titled *Going mobile for health and wellness*. "*Going* mobile" reflects the fact that participants make an active choice to use mobile devices as part of their health and wellness. The phrase suggests movement and being on the go which indicates that this is an action-oriented phenomenon with many information encounters and situations shaping the overall information experience.

All participants in this study are *active* participants in their health and wellness. Their health concerns are often a call to action, and they respond to this call in various ways. This action does not exclude medical advice because participants also integrate advice from their medical doctor. However, *Going mobile for health and wellness* reflects what Ella refers to as finding her own way for health and wellness and mobile devices provide various options to do so. Participants use their mobile devices to meet their health and wellness needs (as well as interests), and they develop their own personal health and wellness strategies alternatively or additionally to the advice of health professionals. The theory of *Going mobile for health and wellness* provides conceptual understanding of the studied experience.

For participants, *Going mobile for health and wellness* is an interplay or fusion of three major elements in one phenomenon. The three elements are *the mobile element*, *the health element* and *the information element*. These three elements are interdependent and interrelated when viewing the phenomenon. They can be studied separately, but this would not provide a true and complete picture of the phenomenon. The understanding that participants experience the phenomenon as a personal experience which includes mobile, health and information elements indicates that participants bring their experience of all three major elements as well as experience from other contexts when *Going mobile for health and wellness*. They relate to the phenomenon in personal ways based on their purpose, personal experience and preferences.

In accordance with constructivist grounded theory, the categories of experience were the result of the co-construction of meaning in a researcher-participant partnership (Charmaz, 2006; 2014). These categories represent an interpretive portrayal of the twelve participants' collective experience of the phenomenon. Each category of experience is distinctive because the experience of the phenomenon is manifested differently in each category with some diversity within each category. Each category has its unique chemistry or dynamic between the mobile element, health element and the information element. Not all participants experienced each category. However, it was common for participants to experience multiple categories concurrently. All participants experienced *Knowing myself* and *Feeling connected* while *Facing uncertainty* and *Doing my own research* were experienced mostly by female participants. Six of the twelve participants experienced *Motivating myself*.

For the purposes of this study, "mobile-mediated" information simply means that information was accessed via mobile devices. I also refer to internal and external information types. External information often included mobile-mediated information. Internal information was sourced internally from self. In this study, participants continually integrated internal and external information. In Chapter 6, I explain information types in greater detail.

The following table is a summary of the categories of *Going mobile for health and wellness.*

Table 5 Summary of Categories of Experience

Category of experience	Description
Category 1: *Knowing myself*	The phenomenon is experienced as mind-body awareness which is basic to self-care and this is supported by mobile-mediated information. *Knowing myself* includes knowing *about* myself and knowing *for* myself and supports all other categories of experience.
Category 2: *Feeling connected*	The phenomenon is experienced as feeling socially connected with the support of mobile technology. Social connection is basic to each participant's sense of wellbeing and includes staying in touch and sharing everyday life moments with family and friends.
Category 3: *Facing uncertainty*	The phenomenon is experienced as engaging with mobile-mediated information to confront and manage risk and uncertainty about health and wellness both strategically and emotionally. Participants often have a heightened awareness about their health associated with a sense of urgency to act and this action involves their mobile device.
Category 4: *Doing my own research*	The phenomenon is experienced as integrating information from the Internet via mobile devices with personal experience for specific health and wellness concerns. Research typically requires obtaining trustworthy online information and is done alternatively or additionally to the advice of medical doctors.
Category 5: *Motivating myself*	The phenomenon is experienced as motivating personal fitness and diet routines by *knowing myself*, feeling good and using mobile devices.

I now present each category in detail. Each category includes "aspects" which are subcategories. I include quotes from interviews to support and illustrate these findings. Although I write in an academic context, the studied experience lies in an informal, everyday life context and this is reflected in the excerpts provided.

5.3 CATEGORY 1: KNOWING MYSELF

All participants experienced Category 1: *Knowing myself* because knowing mind and body is critical to health and wellness. In this category, participants continually integrate internal information and external mobile-mediated information. Internal information (sourced internally from self) includes beliefs, personal experience, personal preferences and feelings (physical and emotional) and instinct and intuition (inner sense).

Overlapping aspects in this category include knowing from lived experience, observing cause and effect, observing my feelings (physical and emotional), following my instinct and intuition (inner sense), knowing my inner circle, knowing my beliefs, knowing my preferences, following my health and wellness interests online and knowing my patterns. This category is closely related to Category 5: *Motivating myself* because *knowing myself* both motivates and guides personal pursuits. However, in *motivating myself* participants focus on their fitness and diet routines while *knowing myself* includes anything and everything associated with what participants consider to be health and wellness.

Knowing myself supports all other categories of experience because personal knowledge and self-awareness from lived experience are basic to relating socially via mobile devices (that is, Category 2: *Feeling connected*), recognising and managing risks and uncertainties about health and wellness (Category 3: *Facing uncertainty*), searching via mobile devices in response to these concerns (Category 4: *Doing my own research*) and committing to fitness and diet routines with the support of mobile devices (Category 5: *Motivating myself*). Participants are highly aware of personal motivators and demotivators in their routines (see Category 5: *Motivating myself*). In short, self-awareness is a precursor to self-care.

Knowing myself includes both knowing *about* myself and knowing *for* myself. The former is about mind-body awareness while the latter emphasises knowing what it is to be healthy and well personally, from lived experience. *Knowing myself* involves both kinds of knowing because participants know about themselves *from* their lived experience. For example, Richard knows his preference for training and losing weight privately with his fitness apps because, as he states, “I was never a runner [and] I’m not very fit” and “I accept I’ll never be a triathlete”. He knows himself from lived experience which is reinforced by his current feeling and thinking:

to me, it goes back to why I probably wouldn't be successful at Weight *Watchers. It's not something I feel, I think probably, I don't want to share the failure as much as that.* (Richard)

Yet, Richard successfully lost 13 kilos in the past year, so I understood that his concern was more about being on display if he happened to fail. In this example, Richard experiences *knowing myself* as knowing and accepting his limitations which also influences knowing his personal preference for training with his apps. (This is discussed further in the "Knowing my preferences" section in this category description).

Everyday life comprises many information encounters, and, for participants, their mobile device is instrumental in this experience both literally and figuratively speaking. Learning from experience is continual and cumulative and although participants learn and share experiences with other people, their personal experience is, by definition, personal. Participants know themselves from their lived experience which entails acting (doing), observing and comparing.

5.3.1 Knowing from lived experience

For participants, an essential part of health and wellness was experiencing and knowing what it takes to be healthy (and to live well) and their mobile devices support this knowing. This entails knowing what is good or right personally, in other words, knowing from personal history or lived experience. For example, Reg knows what 10,000 steps feels like by walking them. He reflects "they do say you should try and do 10,000 a day. Well, I had no concept of what 10,000 really was… Now I do… It's actually a fair bit of effort to do 10,000". Reg can conceptualise 10,000 steps only after he has taken them (and his mobile device has counted them).

In comparison, because Aziz *can* conceptualise walking distance from his lived experience, he decided that Fitbit was *not* for him because it did not influence his commitment to fitness:

Aziz: *I moved to Fitbit. …And I realised that it is an utter waste of time.*

Julie: Why is that?

Aziz: *Because it won't, if I'm interested in being fit then it's my, it's my commitment to me. So, a device is simply not going to help me.*

Julie: It doesn't change anything?

Aziz: *It doesn't change anything. I used it for about six months and I realised that whatever information the device is recording me, I already know. I know if I'm walking twenty minutes.*

Julie: Yes?

Aziz: *I'm going to burn this many calories because I can figure it out. …Because after three or four months of continuous walking. …I know already.*

After three or four months, Aziz could figure out his walking metrics which made tracking with a mobile device redundant. Speaking from experience, he states that "I already know" and "I know already". He also knows his preference for walking *without* a mobile tracking device from his lived experience.

5.3.2 Observing cause and effect

For participants, knowing what it takes to be healthy and well involves observing cause and effect in everyday life. In other words, lived experience includes experiencing the consequences of their action, or inaction in Reg's example. He knows from regular cholesterol tests that "if I don't do exercise, I know my cholesterol goes up". Liz also observes the unpleasant consequences of not exercising, stating that if she has a couple of days without exercise, she thinks to herself, "Oh God I feel really ugh!". I understood the groan to mean that she felt very sluggish.

Richard has also learned from cause and effect. He knows from his personal weight loss experience (using mobile apps) that reducing the caloric intake of food has more of an impact on his weight loss than exercise as he conveys candidly:

> *I've found it just being more aware particularly of what food I stick in my mouth because I've discovered it's more important what you stick in your mouth rather than how much running around the paddock you do.* (Richard)

Richard has become more aware of the caloric value of food over time because of his food diary app which plans meals and counts calories for him:

> *And, I think generally over the course of using that app over the last year, I've probably become more aware of the ingredients I'm using and how to still prepare reasonable, well, good food but just not full of energy.* (Richard)

Although Richard was the most calorie-aware participant, other participants were focused on various aspects of food and how it affected them personally. That is, they observed cause and effect from eating. For example, Miles revealed that "to me it's really obvious when I'm grumpy because it's food-related" and his observations prompted him to Google what he calls "proper" food on his smartphone.

While Miles focuses on "proper" food, Nikita believes in organic and fermented foods and tries to "stay away from starchy foods". She also observes cause and effect from food and defines her belief which likens the human body to a car that needs the right fuel:

> *I'm one of those people that firmly believes what you put in your body is going to maintain it. You know [if] you don't service your car and you run it on empty, things like that, it's not going to perform very well.* (Nikita)

Nikita knows for herself that she needs "to steer clear" of food that disagrees with her, suggesting that such foods are road obstacles to avoid. Importantly, it is her smartphone that provides alternative information about alternative health options, that is, alternative to mainstream health. Nikita's smartphone is her preferred way of accessing health information partly because "I don't really see the GP [general medical practitioner] as somebody who is going to give me an alternative". Using her smartphone for health and wellness information is appealing to her because she doubts mainstream health from past experiences on the one hand and enjoys browsing for health information on her smartphone on the other. Nikita knows that her approach suits her from observing and living the cause and effect of receiving inadequate advice from her GP.

In comparison, Ella observes cause and effect as well as variation in people's body biochemistries. She integrates mobile-mediated information with her own observations about nutrition. For example, she has learned that digestive dysfunction can be based on genetic makeup which makes her more attuned to comparing how she and her partner react to the same food:

> *we'll be eating the same food and he's got a lot of energy and he's really healthy for, you know I'd be feeling quite sort of tired you know I'd be thinking "why?". We're eating exactly the same things. There must be something in my biochemistry that's preventing me from getting the proper nutrition from the same foods* (Ella)

Although observing and comparing may not provide answers to health and wellness concerns, they do provide information. Ella does not know why she reacts to certain foods, but she knows she and her partner react differently. She said, "I think because he doesn't have great food sensitivities, he's been pretty lucky that he can just eat whatever he wants". Ella was informed by both cause and effect and variation of experience as well as her research into nutrition. Her observations in everyday life are ongoing and she expressed her interest in a natural product available online:

> *I know that you can, you can buy like a, something to have just before you have meals, that …offset allergies. It might be some type of histamine antihistamine type of thing but a natural thing which I did think about just purchasing on i-Herb just for experimenting* (Ella)

Ella plans to experiment which includes observing the allergy-offsetting effects of a natural health product. I understood that she was both curious and eager to ease her food allergies.

5.3.3 Observing my feelings (physical and emotional)

Participants experienced *knowing myself* as observing and listening to their body and emotions. The body is a source of primary, internal information in that participants observe symptoms, changes and even physical movements. For example, Miles knows from his physical performance how competent he is at CrossFit. His goal is to be invited by the head coaches to join competition classes, but he said, "I know myself I'm not quite ready for that because there's a lot of movements that I'm still struggling with… so, I'm still, at certain movements, very novice".

Participants also observed knots and niggles which were uncomfortable physical feelings. Muscle knots informed Miles that he needed treatment and he checked trigger point charts on his smartphone to self-treat. He can discern by physical feeling when a tight muscle is "serious and [I] need to see someone" (the "someone" he sees is typically his physiotherapist). Likewise, Shanna observes and responds to physical symptoms she calls "niggle[s]". She usually knows if the niggle is minor or "something major" that needs medical treatment.

Emotional feelings, both pleasant and unpleasant, were also informing. Participants spoke of a range of emotions when *Going mobile for health and wellness*. Nikita states that she was "really happy" when a natural product she found on her smartphone worked on her baby's

eczema while Dee said that music from her mobile device keeps her "happy and motivated". Charly told me that discussing her symptoms via instant messaging resulted in a group panic with her friends in an extreme example of shared emotions. In comparison, Dee said that she and her parents felt "very nervous" when her father was preparing to undergo surgery. These examples of emotional feelings are highly significant because they alert participants to health and wellness concerns. Happy feelings indicate wellbeing while uneasy or troubling emotional feelings prompt participants to do their own research (Category 4: *Doing my own research*) and, additionally or alternatively, to seek social support and connection with family and/or friends (Category 2: *Feeling connected*). Specific examples of observing feelings of uncertainty and unease about health and wellness are presented in Category 3: *Facing uncertainty*. This present category *knowing myself* relates to Category 3: *Facing uncertainty* because observing feelings of uncertainty is supported by *knowing myself.*

5.3.4 Following my instinct and intuition (inner sense)

For participants, both instinct and intuition were internally sourced information used to guide everyday health and wellness. Although the concepts are not exactly the same, I refer to them both as "inner sense" because they were sensed internally by participants which made them difficult for a researcher (or anyone else) to observe and define. I gleaned that they can be felt yet are not just emotions. Amelia values what she calls "instinct" as a mother of a young child which entails listening to her child and herself for health and wellness needs. Similarly, Ella used the term "intuitive sense" to describe how she knows if certain foods suit her body's biochemistry (which, for her, is part of "observing cause and effect").

Dee used the word "paranoid" to describe how she felt about her fear of developing skin cancer. Although this seemed to be more of an emotional feeling or hyper awareness, paranoia could also be seen as a heightened inner sense. For the purposes of this study, "instinct" is considered a natural impulse or reaction to stimuli while "intuition" is the ability to understand something though inner sense or inner knowing. Dee's paranoia is a reaction to her family history of skin cancer. Although she calls it "paranoia" rather than "instinct", she felt compelled to act by researching for information about the disease on her mobile devices (see Category 3: *Facing uncertainty*).

5.3.5 Knowing my inner circle

For health and wellness, participants experience one-to-one or small group mobile-mediated communication within their "inner circle" as customary. The inner circle is their social group of trusted people that typically includes family and/or friends and is more intimate and supportive than their social circle which also includes acquaintances. For Aziz, the divisions between family, friends and colleagues are fuzzy because he considers them all to be family. In her personal life, Shanna just wants to share with family and friends via text message, email and Facebook. This includes people in her boot camp (fitness) group. Miles also considers his gym coaches and peers to be in his inner circle when it comes to fitness and describes the community as "close".

The inner circle social group was self-defined by each participant. They were selective about what they shared and who they shared with. In fact, participants mostly preferred privacy online and excluded strangers. As a norm, participants valued mobile-mediated interactions with people they trust and already know in-person because strong social ties provide both practical and emotional support in everyday life and were reinforced by everyday informal, virtual interaction. Caring was typically reciprocated and knowing one's inner circle was basic to interpersonal relationships. When *facing uncertainty*, some participants turned to members of their inner circle for guidance and emotional support.

Conversely, some participants used information to look after people in their inner circle (see also "Sharing and caring about elderly relatives" in Category 2: *Feeling connected* and "Caring for relatives" in Category 3: *Facing uncertainty*). Broadly speaking, all participants care about someone because they all connect socially with someone in their inner circle. I found "caring" to be a problematic concept in this study because the term denotes both emotional feelings of empathy and concern as well as caring actions. For this reason, I use the terms "caregiving" and "information caregivers" when referring to the action of providing care which involves information. I relied on participants to reveal their feelings of care for people in their inner circle through their words and actions and I focused on caregiving actions involving information. Naturally, caregivers can also have feelings of empathy and concern.

Caregiving participants take varying degrees of responsibility for the health and wellness of their relatives in their inner circle. It was more common for female participants to assume the role of caregiver and information caregiver. This does not necessarily equate with assuming

the role of dedicated carer although mothers of young children in this study (Nikita, Amelia, Shanna) assume responsibility for their children's health and wellness. Rather, it simply means that part of *Going mobile for health and wellness* includes searching for and evaluating information on behalf of their relatives. As a teaching assistant at a primary school, Nikita's care (which involves empathetic concern *and* caring actions) also extends to young children in the classroom. She researched behavioural disorders on her smartphone to understand some of the children better (see "Researching in everyday life" in Category 3: *Doing my own research*).

In this study, mothers of school-aged children or younger were information caregivers. Nikita had the dual roles of mother and teaching assistant. Other participants also cared for their respective relatives by assuming the dutiful role of information caregiver because they were more willing and able to find mobile-mediated information than relatives in their inner circle. For example, prior to her mother's surgery, Ella used her mobile devices to search online about the effects of fish oil on blood clotting. She advised her mother to stop taking fish oil capsules because of the risk that "it will prevent blood clotting". Although her mother is, as Ella states, "a great believer in modern medicine" and prefers to listen to her doctor, she took Ella's advice because she also trusts Ella. I found that participants trusted people in their inner circle and although information giving or providing could be one-sided, trust was typically mutual.

5.3.6 Knowing my beliefs

Participants were informed by their beliefs, and these beliefs guided their approach to health and wellness. For example, Nikita's belief that cortisone cream was not the right treatment prompted her to search online via her laptop for her infant son's health concern. For participants who are primary carers, *knowing myself* extends to knowing personally about the health concerns of their relatives (which is knowing *for* myself). Nikita sees it as her responsibility to know about her son's health concern and his concern *is* her concern:

> *When my son was a baby he had eczema pretty bad and when I took him to the GP about it he wrote me a script [prescription] for some sort of you know cortisone cream and I just thought, "no I'm not putting that on, you know, on my baby", and I did on the laptop then a lot of research on what types of products were out there that I could use for babies. I tried heaps of different*

> *creams like organic creams things and I did eventually find one that worked for him which I was really happy about.* (Nikita)

From the passage, it is evident that Nikita doubted her doctor's advice and the cortisone cream as a treatment. She rejected her doctor's cortisone cream prescription. In this instance, it was difficult to delineate knowing from believing and fact from opinion because the doctor knows medicine and Nikita knows her son. Whatever the case, knowing my beliefs also includes knowing my own mind, that is, knowing what is good or right for personal health and wellness. Nikita observed that a natural product she researched online worked which made her "really happy" for her son's sake (and I understood that she also felt happy because her beliefs were validated).

In comparison, Ella's beliefs about nutrition extend to care of her pet dog. She states, "humans and animals in general are meant to be eating food, you know, as close to as nature intended". In this respect, Ella knows her mind and lives by her beliefs because when her dog was unwell, she followed an unprocessed food recipe from her smartphone. She told me "I found a recipe that includes raw chicken, nutritional yeast and, you know, some vegetables… the food was really high in B vitamins". She felt reassured that her dog "responded well" to raw meat rissoles with improved health. The experience also confirmed her beliefs.

The experience of symptom relief strongly influenced Ella's belief in both natural and mainstream medicine. She believes in acupuncture treatment because it relieved her joint aches and pains from fibromyalgia. Her rheumatologist recommended acupuncture and exercise as "the only medicine" which guided her, yet also highlighted the limitations of Western medicine. This personal experience, or what Ella refers to as "my first encounter with alternative or complementary medicine", influenced her beliefs and prompted her interest in alternative health which was combined with Googling on her laptop for health and wellness years before she purchased her smartphone. Despite being the only participant who has an occupation in healthcare, Ella also believes in herbal remedies and doubts Western medicine because doctors did not give her the nutritional support she wanted and could not help her with recurring sinus infections. A herbal remedy from a naturopath cured her sinus infection and made her "doubt modern medicine". In both encounters (that is, when Ella suffered the symptoms of fibromyalgia and recurring sinus infections), Western medicine fell short and alternative or natural health had a profoundly positive impact.

While, Nikita and Ella (who are sisters) believe in natural health which includes natural products and natural food, other participants indicated that they believe in Western medicine. Amelia said that she trusts her new doctor because he is a Western doctor and Liz is a firm believer in medical doctors largely because her father was a doctor. She believes in medical journals and referred to *The Lancet* as her "Bible" for medical matters. Although this may be just an expression, I posit that it signified the nature of her trust and belief. Consistent with this belief was her assertion that she "would never try to self-diagnose".

Participants engage with mobile-mediated information for both medical matters and natural health alternatives. For their health and wellness, participants were guided by their personal experience, personal beliefs, advice from family, friends and health professionals as well as mobile-mediated information. This entails the integration of numerous types of internal and external information. Personal preferences also guided participants which is the topic of the next section.

5.3.7 Knowing my preferences

Part of *knowing myself* is knowing personal preferences and a variety of personal preferences inform participants in their pursuit of everyday health and wellness. Participants were particularly expressive about preferences related to fitness because knowing personal preferences was important to motivating fitness routines. Knowing and following their preferences was motivating for participants. *Going mobile for health and wellness* was an active choice and a personal preference common to all participants.

Often, participants know their preferences from their limitations and dislikes. For example, Miles and Richard know their preference for tracking personal fitness progress (or failure) privately. Richard revealed his fitness limitations and his dislike for group exercise. He said, "I don't think I'd be the sort of person that would naturally go along to a group type activity". I understood that because he knows his preferences, he avoids dieting in a group and chooses to lose weight privately and independently.

For health and wellness, participants prefer specific media or channels of communication via the mobile platform for certain purposes. This includes knowing the media preferences of people in their inner circle. Typically, text messaging, instant messaging, audio-visual calls and e-mailing were preferred channels. Nikita stated light-heartedly "I send so many text messages that it's ridiculous…it's heaps" which indicates that she was aware of her preference as well as the large number of messages she sent. Generally, participants preferred

not to talk via telephone calls for health and wellness. Although participants cited several examples of audio-visual calls, they rarely mentioned using their mobile device for traditional, voice-only audio phone calls. Zoe said, “I don’t usually call people on the phone…I don’t talk on the phone that way”. Tellingly, Aziz referred to phone calls as “the old method” of communication when comparing them to audio-visual calls. Charly revealed that in daily life she does “a lot more messaging than phone calls” because telephone calls are impractical for keeping on top of things and organising events.

Several participants said that they preferred to avoid social media and conveyed their misgivings unprompted in the interview. Their preference for avoidance (or non-use) was more about preferring privacy than a dislike of social media. However, Reg explained that his niece “puts inappropriate stuff up” and “a lot of people put stuff up on it [Facebook] and I unfriend, not unfriend them, I just don’t want to see it”. Reg just wants to use social media for sharing with immediate family. Participants also specified their non-use of other sources such as Wikipedia for medical matters because it is untrustworthy (Liz) or online forums because they are not helpful (Miles), but they were isolated examples. Nikita said “I don’t use Facebook or Twitter or anything like that” because she thinks it is impersonal. Dee was also resolute in her preference stating that, “I tend to stay away from anything that’s going to post on social media. I don’t like people knowing that level of information about me”.

Sometimes, participants used mobile-mediated information to ease feelings of boredom and knowing their personal preferences influenced action. For example, because Zoe was “bored with breakfasts”, she searched for a “variety or options” online. Likewise, Richard used his apps for music to make exercise “less boring”. In comparison, Miles said “I hate going to my local gym. I found it boring”. Consequently, he started CrossFit, which was a challenging and motivating alternative for him because, as he states, “it was everything I wanted because I was just always motivated”. Miles was motivated by a combination of online and offline elements namely hands-on coaches and mobile apps both of which support his fitness routine. Boredom can motivate participants to seek more options or variety and knowing personal preferences and personal motivators can alleviate boredom.

Unpleasant or negative experiences influence participants’ preferences. For example, Aziz quit Fitbit after six months because, as he states emphatically, it was “an utter waste of time”. It was a negative experience for him because he values both usefulness and time highly. Participants prefer what feels good or right to them personally and past experience influences this. Naturally, pleasant experiences also influence preferences. In Category 5: *Motivating*

myself, feeling good (physically and emotionally) was both a motivator and an indicator of health and fitness. For participants, feeling good is also a goal in itself. Richard's music playlist on his app entertains him. The exercise-entertainment mix during his solitary times makes him feel good. He both knows and follows his preferences:

> *I find that, particularly when I'm on my own, which I am a lot in my life, and I'm away from home that having something that tracks my activity that also entertains me on the way, is great.* (Richard)

Some participants know and follow their preference for a combination of mobile technology and nature for health and wellness. For example, Shanna prefers using her Garmin watch (wearable technology) and "admiring the outside, outdoors" when training for half marathons. Knowing and following her preferences makes her fitness routine more motivating. Similarly, Reg is "a morning person" who feels energised to walk with his app when the "sun's up" and the pet "cats are up". At night, Dee listens to meditation programs with ambient nature sounds and she also finds recordings of whale sounds to be soothing. Personal preferences guide these participants in their health and wellness pursuits, and they know their preferences from lived experience.

5.3.8 Following my health and wellness interests online

Participants know and follow their health and wellness interests when browsing online via their mobile devices. By "interests" I refer to their health concerns, their personal preferences and what they find practical, amusing, engaging, inspiring or newsworthy, and note that following interests may involve a combination of these.

When following their interests online, participants search various topics on their mobile devices such as sport (Charly), recipes (Nikita, Ella, Dee, Richard, Miles, Amelia, Zoe, Shanna), "different juice ideas" (Amelia) and "what the weather's doing" (Reg). Topics of interest are usually light and enjoyable because browsing is leisurely in comparison to researching health critical topics in Category 4: *Doing my own research*. However, there was no clear distinction between "research" and following curiosity and interests other than how participants defined them as actions. "Research" *was* often well-defined although there was some overlap with light topics of interest. For example, Ella described her research to be "very thorough" and I understood that it was broad as well because she considered the following to be research although it was not necessarily relevant to her personal health. She told me she was interested in learning about other people's health experiences in general:

Ella: *I just like to read about other people, you know, how health in general, health problems even though they don't affect me, yeah, I just like to read about*

Julie: As a general awareness?

Ella: *And interest as well. I guess it comes from working in health, yeah.*

Ella was the only participant who voiced an interest in buying health products online for health and wellness. For her, *Going mobile for health and wellness* was also a shopping or consumer experience.

In comparison, Reg was concerned with his mental health and finds that following his interests and keeping informed are interwoven. He states that, "in terms of mental health, in the mornings when I'm on the train… I'll actually go to ABC [Australian Broadcasting Corporation] *Just in* [online news via his smartphone] and just get a scan through". Awareness of current events makes him feel connected to the world or society at large. He explains:

> *Sometimes there are stories that are health related. …Because ABC carries sort of stories that are latest ideas about fat or not fat. … So, in a way that's another way I sort of get sort of insights you know and that's interesting. …So, at least once a week there will be, or even twice a week, there'll be some story on the ABC Just in which you can go digging, dig deep into. …I scan through but it's, so in a way that keeps me sort of in a mental health way, I feel connected and whatever.* (Reg)

For Reg, topics were not necessarily health related. Rather, he kept up with news *for* his mental health. In comparison, Nikita follows interesting topics online via her smartphone that *are* health-related stating that, "I think I'm almost looking at health-related topics on my phone almost every day". She explains:

> *when I put my son to bed at night half the time I'm too tired to come back out and watch TV but I'm still awake enough and I just lie in my bed and look at my phone and good old Wi-Fi and [laughs] you know you read one thing and you go onto another and you just yeah…Yeah oh well, sometimes it's even if I'm just looking for a recipe that's got certain ingredients in it and then you know they might have links to other recipes and food websites and or if I just*

> *find a topic that I think that's really interesting like, "Oh, I've never heard about that before and people actually have this?"* (Nikita)

Both Reg and Nikita follow interesting news or topics by flowing from one story via hyperlink to another. Reg digs deeper if he finds a story that piques his interest which means he follows links to other stories and recently published research. He mentioned that there is sometimes "a rather bizarre connection" which suggests that his searching (or digging) uncovers some unexpected results. While Reg digs, Nikita depicted a cosy scene in bed reading her smartphone with "good old Wi-Fi" in which she followed her curiosity spontaneously. Regrettably, I did not ask her for examples of the "really interesting" topics however, ingredients for recipes were part of the mix. I understood that Nikita felt a sense of wellbeing browsing by interest on her smartphone.

Amelia also follows "really interesting information" and said that "one interesting thing leads to another" when Googling for baby-related information in general. She also reflected that browsing social media via her smartphone can be:

> *a bit endless really. If I like a yoga studio on Facebook, like if I like their page, and then I find they're following a person who is a nutritionist or something, I can slowly get some really interesting information.* (Amelia)

Amelia persists until she "slowly gets some really interesting information", that includes "different findings, different health things to do" for people on the Paleo diet. She clarified that "I'm not on a Paleo diet. I'm just really interested in keeping up with that". Like Ella, Amelia was interested in following health and wellness topics in general.

A combination of health concerns and personal preferences guide participants in following their health and wellness interests online. In short, participants follow their interests in every sense of the word and reading for health and wellness information on their mobile device was experienced as practical, insightful, flowing and enjoyable. Sometimes, participants knew it was in their interests to *stop* looking online which I outline in "Feeling overwhelmed by health information" in Category 4*: Doing my own research*.

5.3.9 Knowing my patterns

Participants know *about* themselves *from* their lived experience and this includes observing patterns in their lives. Participants experienced patterns as recognisable habits or routines that were related to sleep, diet and fitness.

Both Richard and Reg identified their fluctuating fitness pursuit patterns which were supported by mobile apps. This enabled them to be independent and solitary in their exercise routines. Reg said, "I'm a bit fitful with my fitness if that sounds wrong but I suppose I've had bouts of doing". Richard who is a commercial airline pilot described a similar experience because of his job. He said, "I guess that's the product of my life. I go through spates of activity and then I patter off". He elaborated that "I'll get to a point and I'll slacken off a bit… which might not be the ideal but that's the way it is". Knowing their patterns, Richard and Reg both pursue fitness in a solitary way, motivated by their fitness apps and incremental changes. They both accept their "fitful" or fluctuating fitness efforts and follow health and wellness routines that suit them.

Shanna follows a routine that suits her, a relaxing bedtime pattern which includes checking Facebook on her mobile devices:

> Shanna: *I feel so exhausted. I'm up at 5:30 every day go, go, go. I fall into bed at 10:30 and then I just want 10 minutes. It's just to me, it's something not deep or anything. That's my sort of downtime. To think what everyone's been up to for the day and then it's often, it's bedtime whereas they say it stimulates a lot of people. But for me*
>
> Julie: It's the opposite?
>
> Shanna: *Yeah. I don't have any book to fall asleep. Yeah, I have my 10 minutes.*
>
> Julie: That's really interesting. So, you find that relaxing?
>
> Shanna: *Yeah, I think so. It just allows me to escape whatever's happened during the day. To see what everyone else is up to.*

Shanna relaxes during her short, "not deep" downtime seeing what "everyone else is up to" via mobile-mediated social media. For her, it is a short, virtual escape from the events of the day that is socially connecting. Wanting to know social news and following personal interests may also be considered instinctive.

Liz experienced the opposite of relaxation when she used her mobile devices before bedtime. For her, over-analysing sleep patterns was counterproductive because it caused insomnia. Her Fitbit counted the minutes she was asleep, awake and restless. It also graphed this data. Liz found that for sleep monitoring, Fitbit was "the most hideous" and "the most stupid thing",

because she "became obsessed" about the breakdown of her sleep pattern. Consequently, Liz simply stopped using Fitbit for sleep monitoring. She also tries not to use her tablet computer close to bedtime because screen time is over-stimulating and not conducive to sleep.

Other participants recognised the need to change their patterns and not necessarily incrementally. Miles needed to change his dubious diet. He described his previous habit or pattern of going to work with only a piece of toast and energy drinks stating, "I'd get really grumpy and have a sugar crash". To change this pattern, Miles cut back on energy drinks and ate properly in general, sometimes following Googled recipes on his smartphone that included "lean protein, vegetables and carbs". Although he still drinks Coke during the day, he explains his new pattern at breakfast:

> Miles: *now I have a proper meal. …A proper cup of coffee. And, that tends to sustain me a lot longer.*
>
> Julie: Yeah, so what works for you is very much like what makes you feel, you know what makes you feel well?
>
> Miles: *Yeah, definitely.*

Like all participants, Miles knows what suits him and what does not from everyday personal experience which includes recognising patterns. What participants know or believe to be good or right, what they find concerning or interesting for them personally is, by definition, personal and subjective. A vital part of health and wellness is knowing from experience what it takes to be healthy and to live well (see "Living well with risk and uncertainty" in Category 3: *Facing uncertainty*).

5.3.10 Summary

All participants experienced Category 1: *Knowing myself*. This category includes both knowing *about* myself and knowing *for* myself. Both kinds of knowing support all other categories because a basic part of health and wellness is knowing what it takes to be healthy and well from personal, lived experience. This lived experience includes the integration of mobile-mediated information for health and wellness as a personal preference. *Knowing myself* supports all other categories of experience and has a particularly strong relationship with Category 5: *Motivating myself*.

5.4 CATEGORY 2: FEELING CONNECTED

All participants experienced Category 2: *Feeling connected.* I found that social connection and supportive relationships were profoundly important to their sense of wellbeing. In this category, participants felt socially connected to people they already know in-person via their mobile device. Participants value virtual social interaction highly during times of separation or isolation from their inner social circles because this social connection supports feelings of belonging and reassurance.

Aspects in this category include experiencing constant mobile connectivity, blurring contexts, sharing selectively, sharing moments, integrating online and offline moments, sharing and caring about elderly relatives, feeling close despite distance and updating via "walkie-talkie". In this category, participants value "feeling connected", "staying in touch" (Reg), "sharing with friends and family" (Nikita), as well as to "just kind of update" friends (Zoe). Participants used phrases such as "share it with everyone", "to see what everyone is up to" (Shanna) and "accessibility …to everybody" (Aziz) when referring to connecting with people they *know* rather than everybody online. What they really meant was everybody they want to connect and share with, that is, the people they know who are important to them rather than strangers or, as Miles phrases it, "some random person on the other side of the world".

In this study "mobile-mediated" information simply means that information was accessed via mobile devices. Mobile-mediated information forms are virtual, often visual and are highly varied because mobile devices host many ways of interacting. Participants enjoy sharing informal and basic information using small talk (informal, mobile-mediated conversation) and rituals that support social connection such as exchanging photographs. As a norm, participants stay in touch and share everyday life moments with people they care about. Participants also experience constant connectivity with people and information because of always-on mobile technology. This constant connection involved technical, social and psychological aspects because constant connectivity impacts participants' social and information experience in everyday life. It influenced the experience of *Feeling connected* profoundly.

5.4.1 Experiencing constant connectivity

In this study, experiencing constant connectivity was a way of experiencing information for health and wellness in two main ways. These ways include the ability to access mobile-

mediated *information* instantaneously at any time and feeling constant social connectivity to *people*. Constant connectivity supports feelings of connection which also impacts other categories. For example, "Caring for children" which is discussed in Category 3: *Facing Uncertainty*.

Several participants mentioned that their mobile device was always with them which *enables* constant connectivity with information and people. For example, Richard said that his tablet computer "would go with me literally everywhere" and "the phone's always in my pocket" while Dee said, "I can easily jump, usually on my phone, because I always have my phone with me". Always having their mobile device (typically a smartphone) with them includes social and psychological awareness because participants *feel* constant connection (or the potential to be connected) to information and people at any time. Constant connectivity involves a virtual online presence, a social presence and a psychological presence which impacts how participants experience information as the following sections outline.

Constant connectivity also involves *feeling* constant connectivity to people. For participants, constant connectivity is a part of everyday life and they value it for safety and social reasons. The feeling of this connectivity is difficult to explain. However, it is clear that participants felt that people were in close contact. For example, Charly observed that having a smartphone with constant connectivity impacted her feelings of personal safety. She felt safer because she could make immediate contact for help in times of trouble or emergencies. Charly explained that she checks her instant messages hourly because, as she states, "[I] don't want to miss out on something", and I interpreted "something" to mean anything that her friends were sharing via instant messaging. Charly showed signs of what is colloquially known as fear of missing out (FOMO). Aziz also values constant connectivity with people in everyday life although he phrased it differently:

> Julie: So, what is it about the devices, do you think that you want to use them or have them with you?
>
> Aziz: *It's the accessibility.*
>
> Julie: Accessibility. To people or to information or
>
> Aziz: *To everybody.*

For Aziz, constant connectivity is about accessibility to *people*.

5.4.2 Blurring contexts

Constant connectivity contributes to blurring of contexts. I found that participants who use their mobile devices for work and personal life felt the blurring of settings or contexts because the same devices were used across contexts. For example, Shanna experienced constant connectivity as an intrusion into her personal life stating that, "life's so busy and then you've got these things dinging at you". Shanna is on call indefinitely in her work role and because of constant connectivity, she experiences the blurring boundaries of work and personal life as well as "dinging" mobile devices. She said:

> *it's handy [my smartphone] but I must admit I get a bit over it because you can never get away somewhere… and every time it's zing, zing, zing, …and so, then you end up getting stuck on the phone in family time.* (Shanna)

Interestingly, Aziz also experienced blurring contexts, yet did not see constant connectivity as an intrusion. Rather, he sees it positively as "accessibility" to "everybody" and this can be partly explained by the fact that he considers his colleagues and friends *to be family* and did not mention a spouse or children. He also referred to himself as a "workaholic" and my impression was that he enjoys his work. I understood that both Shanna and Aziz value their respective family time and feeling constant connectivity to family was important to them.

5.4.3 Sharing selectively

For health and wellness, participants mostly share with people in their inner circle which means that they typically exclude strangers. In some examples, participants were also selective about *what* they share with people they know. For example, while Richard was conscious of oversharing mundane fitness activities on social media, Miles was selective about *who* he shared with on social media stating that "everything I do, I put in My WOD [Workout Of the Day] which is a personal one and then I can share it with Facebook friends or people I know". (WOD is both the workout and an app for CrossFit tracking).

Charly was also selective. She unfriended her ex-boyfriends on Facebook to block their virtual connection stating that she uses her smartphone for "friendship" with people she also sees in-person which no longer includes her ex-boyfriends. Charly said, "I'd probably prefer face-to-face" when talking to friends to see their facial expressions and "because it's not in a recorded setting". She prefers privacy in one-to-one contact but instant messages via her smartphone for convenience in a larger group. She explained that instant messaging is for

larger groups when "it's not something really embarrassing" or when "you're not going to see someone for a while and you want a quick answer". As a tactic during group instant messaging, she sometimes changes topic if she feels "displayed" to avoid embarrassment. No other participant described this experience although Richard was self-conscious about his weight loss failures being made public on social media or in-person (in a commercial weight loss program). Charly's mobile-mediated interactions with her friends were nuanced and depend on many circumstantial factors such as topic, personal relationships, emotional feelings and personal preferences.

In comparison, Amelia was selective and practical about who she shared with during a specific phase of life, that is, being a "first time mum". Asked how she uses her mobile devices for health and wellness, Amelia replied that her smartphone helps with "connecting me to other mums". She is a member of a private mothers' group on social media with members that she knows in-person and Amelia reveals that the group had more frequent catch-ups when their babies were newborns, that is, before most of the mothers went back to work. These days contact with her inner circle of mothers is less frequent because the members of her group became working mothers (which indicates another new phase in life). Amelia said that "you go through a phase of just the online catch-ups. But, now slowly, we're having one-on-one catch-ups and it's so much more meaningful". I gleaned that she appreciated more meaningful sharing in these one-to-one meetings because conversation was more intimate and involved more than the practicalities of caring for babies.

5.4.4 Sharing moments

Several participants viewed sharing via mobile devices as socially connecting no matter how trivial or emotional the content. In fact, trivia enhanced everyday social interactions and participants felt free to be themselves as well as talk about life's ups and downs and ordinary moments. Sharing was informing and engaging and associated with feelings of familiarity, amusement, empathy and reassurance. Participants share mobile-mediated moments in various ways, including but not limited to e-mailing "absolute rubbish" (Liz), exchanging emojis, sharing photographs of "stupid things" (Reg) or "sneaky little photos" (Zoe), venting about a "crappy day" (Nikita), catching up with other mothers (Amelia), catching up with friends on campus (Zoe) and integrating mobile browsing into dinner conversation (Liz).

The value of sharing trivia was subjective depending on participant preferences and context. For example, it was common for participants to access social media sites via their mobile

platform. However, views on sharing on social media varied. Richard mentioned the oversharing of moments on social media when talking about his fitness routine. He specified that rather than sharing "every time you've walked down the shops", he prefers to share "something significant… but, I'm sure other people share everything". He observed that as a result, most people lose interest because "no one cares after a while". This reinforced that sharing moments involves the sharing of mutually meaningful content and Richard also specified that he prefers "sharing something that's a milestone rather than sharing every event".

The concept of "a milestone" was also subjective. For Richard, running five kilometres without stopping was a triumph that he wanted to share while Amelia considers all her baby's development stages to be milestones although she keeps records rather than posts them. She captures moments and milestones such as first smiles and skin loss on her smartphone notes app to share with her daughter when she grows up. She said, "I felt it was really important information that [my daughter] might want to know". Her plans for sharing were long-term. Richard and Amelia both value their respective milestones and shared them in their own way. Both trivia and milestones were considered something significant, depending on participant perspective.

5.4.4.1 Brightening my day

Sharing in everyday life was personal and often associated with strong positive feelings. For example, Nikita feels connected by sharing the virtual, the visual and the humorous, and "brightening my day" is a gerund based on her words. She enjoys sharing funny pictures and quotes as well as the user-friendliness of her smartphone which is integral to the experience as she enlightens:

> *I particularly love with What's App and Viber, just the ease of sending pictures. It really brightens my day when I get, you know, a funny picture or a quote and I love sharing with my friends and family.* (Nikita)

To "brighten" means to enliven or to cheer and it also means to illuminate or to shed light on the darkness. For Nikita, sharing in everyday life appears to inspire her. However, she was specific about sharing with her friends and family. Reg also feels connected by the virtual, the visual and the humorous via emojis and "funny notes". He also bonds with his family by exchanging emojis to indicate the weather. He showed me the emojis as he explained:

A little heart at the end. Yeah, so it's just another way of, sort of just, a visual with cats. And, that's the other thing, [my wife] sends me, you know, snow… And so, it's just again, it's just a quick photograph you see, and you feel connected. …It's visual. …I think it's quite personal. Wind, wind, wind and rain. (Reg)

During the interview, I commented that Reg and his wife literally talk about the weather, to which Reg responded, "Yeah, yes, of course. We're Poms [English people]. What else would we be doing?". Talking about the weather is part of his English culture and family identity and we both laughed at his self-revealing response. Reg was touched that his wife sent him snow and although it was not real snow (because the emojis were pictographs), they carried sentiment as do other weather symbols that were meaningful to Reg.

Participants also shared humour in the trivial and unexpected. For example, Zoe experiences unexpected sharing when her primary school-aged sister leaves selfies on her smartphone sporadically which Zoe describes as "sneaky little photos". Zoe said that she will "usually laugh". Both a product and phenomenon of the millennial generation, the selfie is an aspect of socialising that is self-expressing and attention-grabbing and Zoe states that, "I go through them and keep like the good ones". This indicated that she valued the photos. Reg also found humour in sharing the unexpected. For example, he said that the auto correct function "can be very funny" when it confuses and misinforms. He recounted how his wife typed that she was going to "do lunch" but auto correct changed her text messaged words to "dojo lunch". He thought incorrectly that she was referring to a Japanese restaurant or that she was doing martial arts and they both laughed about this text messaging mishap later.

5.4.4.2 Venting my frustrations

Several participants vented frustrations via their mobile device. For example, Nikita shares in a friendship group because self-expression and venting frustrations were cathartic for her. She illustrated the content and character of the text messages she shares with her empathetic female friends. This is colloquially known as "girl talk":

Nikita: *Sometimes I might tell them about a good recipe that I've found and other times me and my friends might just be talking about you know having a crappy day or kids are whinging or you know we've pigged out or whatever and we've both come to the conclusion that it's because you know we're both getting our periods soon and yeah that kind of thing.*

Julie: Like emotional support?

Nikita: *Yes, definitely, to vent and then be able to get on with the day.*

Being a mother has its challenges for Nikita and she finds venting about hardships to be therapeutic. For her, venting is an integral part of *feeling connected* and comforted in everyday life. As a father, Reg also vents via text message to his wife but was mindful that his primary school-aged daughter may also see the messages. He explained, "if you're fed up with something, you can just vent if you want to. You have to be careful because, shouldn't vent much 'cause [because my daughter] probably picks it up and reads it". Conversely, Nikita considers text messaging to be discreet because she can type and read without her primary school-aged son hearing her conversations across the room. Like Nikita, Reg also values supportive text messaging which includes venting and staying in touch with his family during a period of separation:

> *it's actually a very useful communication tool which, you know, in that broader sense of staying in touch with someone and being able to help them through when they're feeling fed up… Or if they're elated.* (Reg)

Note Reg's phrase about "being able to help" by "staying in touch" via text message. Specifically, he described how he exchanged text messages with his sister who cracked her vertebra and has "been quite down". About the same time, he was exchanging texts with his wife who was having a "fantastic day" at work. As illustrated in Reg's example, ups and downs can occur simultaneously within a social group and mobile connectivity enables people to voice their feelings, that is, to vent, commiserate, comfort, congratulate and to be present for friends and family.

5.4.5 Integrating online and offline moments

The mobile way of sharing moments includes both online and offline elements. Participants spoke of sharing attention between simultaneous virtual and in-person encounters. For example, Liz and her friends Google about historical events on their smartphones during dinner conversations:

> *Well, I think it's fantastic because you can be having discussions with somebody around the dinner table and you go, "Ah, no that was that and that happened in that year and that" and just Google it, and that's great.* (Liz)

In this scenario, Googling spontaneously at the dinner table to verify facts was viewed positively. Liz sees the integration of online and offline moments in conversation as "fantastic" and "great" in this situation. In another scenario, she said:

> *If suddenly I meet a friend who says her mother has Crohn's or something and I go "Oh, I used to know what Crohn's was, I just need to look that up. What was Crohn's again?" …If you know them really well, you could.* (Liz)

This suggests that the integration of online and offline moments during conversation is dependent on familiarity or knowing someone really well.

In another example, Charly and I considered the integration of the online and the offline to be a part of life during the interview when she instant messaged her friends about an up-coming kite festival. Both of us were relaxed about it and this interview moment demonstrated how normal and integrated constant connectivity feels in everyday life. Charly's roles during the interview were divided between being a responsive friend and being a responsive participant (I believe she was both). This interview moment was meaningful because it was an opportunity to observe Charly during a real-life, real-time social interaction. Although I did not read her messages, I understood the nature of integrating online and offline moments.

5.4.6 Sharing and caring about elderly relatives

For some participants, sharing virtual messages was a way of caring about their elderly relatives' wellbeing. For example, Liz and her siblings e-mail weekly photos of family to their 95-year-old mother in New Zealand who views them on her tablet computer. Liz also uses her tablet to e-mail messages routinely and, like Reg, she also mentions the weather in her written, yet informal conversational style:

> Liz: *I would e-mail her every second day probably just for absolute rubbish, but you know something for her to open in the morning and go "Oh, it's an e-mail you know".*
>
> Julie: When you say rubbish do you mean something entertaining?
>
> Liz: *Oh, it's hot! I just played golf you know. …We're fine, how are you?*
>
> Julie: Yes. Just to keep in touch.
>
> Liz: *Yeah, just so she had something in her inbox.*

Sharing and caring were conveyed in the small talk of an e-mail and, evidently, Liz's "absolute rubbish" content includes simple greetings, golf and the weather which both she and her mother appreciate. From Liz's description, her mother sees the new e-mail to open in her inbox as something of value because it is a message between a sender and receiver that care about each other. The medium (format) also conveys a message, that is, the new e-mail was valued as an object even before the message was read. While Liz uses e-mail, Reg sends simple text messages to his elderly, housebound mother-in-law, Flora, when she is home alone. The following illustrates the kind of caring text message he sends to her:

> Reg: *Just letting you know I am coming home and feeding you… or, Sorry I'm late, I'll get some fish and chips. Do you fancy Thai?*
>
> Julie: So, it's very much connection for her as well?
>
> Reg: *Yes.*

In comparison, Amelia states that she needs good connections to really feed her which means that she sees social connection as a basic need like food which is essential for survival and nourishment. She needs food *and* social connection. Similarly, Reg reassures Flora of both in a text message that was informal and conversational.

Furthermore, Reg guides Flora by showing her how to check the weather because she wants to know the weather in Edinburgh despite being "frustrated with the technology". She is from Scotland and her daughter and granddaughter are there, so Reg shares his app experience with Flora because, as he explains, "we're obsessive about the weather. So, I sort of slowly showed her that's how you do it. And, also the clock. So, she knows how many hours behind". Each day, Flora is highly aware of the time in Edinburgh and she wants to know the daily weather conditions. Hence, learning how to use the clock and weather apps was key. She is physically present in Brisbane, yet her mind is also on Edinburgh. Similarly, when Shanna and Aziz are abroad, they are aware of time zone differences because their minds are on their social circles in their respective homelands. More detail appears in the next section "Feeling close despite distance".

Both elderly mothers (that is, Reg's mother-in-law Flora and Liz's mother) enjoy using their tablet computer to keep in touch. So too, does Richard's aunt who is in her eighties because she is no longer physically able to sit at a desk to use a computer. Flora uses basic information from her tablet computer to feel closer to her loved ones far away and Liz's mother in New Zealand uses her tablet computer to view photographs and messages from

family. For each elderly mother, a personal tablet computer supports sharing and caring with family.

5.4.7 Feeling close despite distance

With mobile connectivity, people separated by distance feel connected and thus closer together. At the time of interview, Reg was in Australia while his wife and daughter were in Scotland for several months. He explains how mobile connectivity alleviated the stress of the long-distance relationship stating that "I had been using Facetime, so that sort of kept [my wife] and I reasonably sane over this period of separation".

Reg also described how he sent photographs of "stupid things" to his wife citing the example of when he spontaneously snapped a photograph of a new bookshop at Central Station with his smartphone camera and promptly sent it to his wife. She loves the bookstore chain, so "stupid things" can be inspiring and meaningful to sender and receiver yet insignificant to anyone else. Reg also exchanged texts and emojis with his family and showed me emojis that his daughter sent explaining them in words, "smiley faces or, you know, tears when she's fed up or something like that". Emojis were invented specifically for mobile telephones. For Reg, they were a mobile way of sharing pictographs of smiles and tears that represent ups and downs. At the time of interview, he had just started using them, so they were a new virtual and visual way of sharing emotions with loved ones far away. He reflected on this engaging experience of emojis and text messaging:

> *So, it's actually a really interesting medium where you can sort of "How are you?" you know. Even, dare I say, I'm obviously getting sucked in, these little faces and stuff…I'm being sucked in. But, in a way, I feel I'm really quite connected. That I can actually, you know, if [my wife's] feeling down or [my daughter] is whatever or [my daughter] can pick it up and send me some funny notes.* (Reg)

Reg used the colloquial phrase "sucked in" twice in the interview. I interpreted this to mean that he felt reluctantly intrigued and immersed by text messaging and emojis. Reg explained his acceptance of mobile devices as a transition from "sceptic" to "a bit of a convert" and in the previous excerpt he still shows reluctance, prefacing his statement with "dare I say". In any case, exchanging text messages and emojis made him feel connected to his family.

Shanna also shares photographs and described her habit of loading them on Facebook at night when she was in South Africa for an extended period. Knowing the time zone difference, she looked forward to responses from people in Australia in the morning. Clearly, Shanna values what she calls "family time" as well as cultivating connection with people beyond her immediate family. Sharing the good times virtually is important to her:

> *Yeah, so that was a real health and wellness experience because we had the best family time and the time of our life in Africa. So, it was really great to be able to share it with everyone [that is, people she knows]*. (Shanna)

Aziz was also separated by distance from his inner circle and culture because he is a foreign student at a university in Brisbane. Yet, remarkably, he states that he does not feel a difference to being physically present. Aziz, a Sri Lankan, continues to socialise and manage his employees in Sri Lanka with the support of his mobile devices. For Aziz, the divisions between family, friends and colleagues are fuzzy and he explained how time zone differences complicate, yet do not impact, his feelings of connection with people he cares about in Sri Lanka:

> Aziz: *my friends, which are like my family, they're, we don't feel that we are away. They're five hours behind and we're five hours ahead so, sometimes when they are waking up I'm already finishing my day. And sometimes when I'm free they're either sleeping or when they're free I'm sleeping so both things are a bit of an issue. But, apart from that, in terms of communication, in terms of meeting them, attending like their parties and everything… I don't feel a difference.*
>
> Julie: OK, so when you say attending their parties, do you mean like virtually attending them?
>
> Aziz: *Yeah*
>
> Julie: So, what do you do to attend the party?
>
> Aziz: *Like with a birthday right. …So, the old method was that you call them and say "Hey, Happy Birthday!" …And now you can go on Skype or you can go to What's App and you can say "Hey Guys, I'm available". So, you can't eat the cake, but somebody will taste it for you.*

Strikingly, Aziz feels present sharing everyday life with his friends and colleagues virtually; the main limitation being that he was unable to taste the birthday cake. I understood his meaning to be literal, that is, besides not tasting cake, he felt present at the party. However, the idiom "you can't have your cake and eat it too" is relevant to his experience because it means that he cannot have it both ways or literally be in two places at once. In reality, Aziz was not at the party, even if he felt that way because of video conferencing. He refers to telephone calls as the old method and, in this old method, communications are limited to voice only. Video conferencing allows groups of people to be face-to-face virtually and includes both audio and visual aspects and Aziz sees it as the new method which enables him to go beyond simply feeling closer or connected, it enables him to *feel present* at the party.

In another example, Aziz spoke about feeling present at the launch of a training program in Sri Lanka while he was in Brisbane stating that "I was physically not there but I was virtually there because of social media". Furthermore, Aziz observes that social media via his mobiles is more informal than in-person contact, and this virtual contact makes communication more "personal" and "open". His greeting "Hey guys" reinforced the casual tone. Aziz prefers this to the formality of "a normal office environment" because it is more conducive to conversation and the "signs of capitalism are not there [because] you're wearing a t-shirt; you're talking to guys and you're just very informal". In this instance, casual clothes were a visual cue that signalled relaxed informality. I understood that it made Aziz feel (physically and psychologically) relaxed. For Aziz, *formality* is socially distancing, and wearing casual clothes in informal interactions is a way of feeling closer socially despite the *geographic* distance.

Unlike Aziz, Amelia felt that communicating virtually was a poor substitute for physical presence. Although Aziz and Amelia have both adapted to major life changes, they have very different roles and responsibilities in life which influence their personal experience. They both know what suits them and what does not. This was a feature of knowing what is good or right personally (which is also discussed in Category 1: *Knowing myself*). Aziz sees virtual connection as good because it is "personal" and "open", and he asserts that, "I'm very well connected with the social media" [which is supported by mobile technology]. In stark contrast, Amelia knows that sharing virtually is not meeting her basic needs for social connection:

> *Facebook has people I don't even really know anymore that are almost like a photo. Because, I haven't seen them for 10 years. Whereas, I think to really feed me, I need good connections, that is, see people with face-to-face contact.* (Amelia)

From Amelia's statement, it is evident that she experiences a disconnect with her Facebook friends and needs "good connections" with people who are physically present (rather than just "a photo"). Yet, her new doctor consults via Skype after an initial face-to-face consultation. Although she did not choose him because of this, she makes "the most of what is available" describing it as a "unique" service that is all provided via her smartphone. She lives in Brisbane while her doctor's surgery is in another city (the Gold Coast). Amelia was the only participant to cite the experience of consulting a doctor remotely. In a similar fashion, Charly said, "I'd probably prefer face-to-face" even though she enjoys sharing virtually with her friends. She instant messages mostly for convenience and also for larger group discussion via her smartphone. She mentioned the limitations of virtual contact and occasional feelings of embarrassment but not the disconnect or social distance that Amelia feels from her virtual contacts. Amelia feels distanced despite or, perhaps, because of mobile social media.

In another example of feeling close despite distance, Liz reached out virtually to friends at a wedding. She was not physically present, yet she enjoyed a few virtual moments by viewing photographs on social media on the day. She in turn shared words of admiration:

> *my friends had a wedding, a daughter's wedding last weekend down all in New South Wales and they whacked on Instagram, you know, pictures up straight away of the wedding so you look at those and comment, you know, bride looks beautiful, just a few words.* (Liz)

Liz has constant connectivity on the go, so she can see wedding photos (that were "whacked", that is, posted on Instagram) as well as send her good wishes in real-time. Similarly, when Zoe's friend travelled to Norway and Finland, she posted photos of her trip on her Facebook profile page. Zoe posted comments and felt vicarious excitement stating that when her friend went skiing "that was really exciting". Mobile devices support the sharing of everyday life moments which made participants feel close, despite the distance. The convergence of mobile technology and social media provides more ways of connecting as I have outlined.

5.4.8 Updating via "walkie-talkie"

The distance between participants and their friends and family was not always geographically far. Participants also contact friends in close proximity. For example, Zoe and her friends keep in mobile contact on their university campus in Brisbane. Zoe describes her smartphone as "kind of like a walkie-talkie" which is a telling phrase. Walkie-talkies use short-range radio frequencies and Zoe both contacts and locates her friends nearby. Interestingly, both the walkie-talkie and the mobile phone were developed by Motorola -- the walkie-talkie for the military in the battlefield, the mobile phone for consumers. Zoe's everyday life is not a battlefield and her smartphone is far more sophisticated than a walkie-talkie. She uses her smartphone in the way in which people use walkie-talkies, that is, sending short, purposeful messages. However, unlike the walkie-talkie messages, she uses text rather than voice. When asked what prompts her to keep in touch with her friends, she said:

> Zoe: *Ah, usually friends go like "Hey where, what are you up to?" or "Are you on campus? Can we meet up, do you have a break at the moment?" That sort of thing. Kind of like a walkie-talkie. ... Just kinda [kind of], "How are you going? How's uni? What're you up to?" Or that, just kind of update….*
>
> Julie: That was interesting that you said walkie-talkie.
>
> Zoe: *Yeah*
>
> Julie: So, is it. Can you explain that a bit more?
>
> Zoe: *I don't know, kind of, so, like "Where are you at this moment?" and, "I will come and find you".*

For Zoe and her friends, *feeling connected* was about updating and locating each other in real-time.

5.4.9 Summary

All participants experienced Category 2: *Feeling connected.* In this category, participants feel connected technically (via their mobile devices), socially as well as psychologically, and this contributed to each participant's sense of wellbeing. For participants, mobile connectivity supports the sharing of everyday life moments in diverse and colourful ways. *Feeling connected* is a socially supportive and highly valued virtual information experience.

5.5 CATEGORY 3: FACING UNCERTAINTY

This category description outlines how participants engaged with mobile-mediated information in various ways when *facing uncertainty* about their health and wellness. In this study, I refer to "uncertainty" as an unknown future or outcome. Participants also face "risk" which is similar because the outcome is also unknown, however, risk has more predictable outcomes. For example, participants with a family history of heart disease face a higher risk of heart disease than the general population, yet they remain uncertain whether they will develop this disease. Although I am aware of the subtle differences between risk and uncertainty, delineating them in each information experience was not a priority. Therefore, I consider the category title *facing uncertainty* to be an umbrella term that refers to people in this study facing various risks, uncertainties and unknowns in relation to their health and wellness.

This category has four main aspects that interrelate and overlap. This includes facing heightened awareness, relieving uneasy feelings, caring for relatives and living well with risk and uncertainty. Emotional feelings associated with both risk and uncertainty prompted participants to act. In other words, emotions associated with health and wellness can be a trigger or call to action. The word "facing" refers to both experiencing uncertainty as well as confronting, problem-solving, or managing this uncertainty. Heightened awareness about health and wellness concerns as well as a sense of urgency and/or uneasiness were often part of *facing uncertainty*. Consequently, participants integrate and engage with information in various ways for guidance and reassurance. Sometimes, *facing uncertainty* was about softening the harshness of the situation.

Facing uncertainty includes health concerns such as surgery (Dee, Nikita), hereditary diseases (Reg, Liz, Dee), high cholesterol (Reg), "man boobs" (enlarged breasts on males) (Nikita), facial spots (Dee), dubious skincare products (Dee, Shanna, Nikita), the side effects of prescribed pharmaceutical products (Liz, Nikita) and the detrimental effects of soy (Nikita). When *facing uncertainty*, uneasiness, or heightened awareness about health and wellness, participants used words such as "conscious" (Reg), "nervous", "scary", "paranoid" (Dee), "panic" (Charly), "fed up", "given up", "feeling sick" (Nikita), "not feeling 100 per cent", "played on my mind" (Amelia), "not working for me" and "left in the lurch" (Ella).

When *facing uncertainty*, participants often do their own research, so there is an observable cause and effect relationship between this category and Category 4: *Doing my own research*.

Thus, this category description refers to participants doing online research in response to *facing uncertainty* because the two are closely related. Often, participants experienced both categories simultaneously.

5.5.1 Facing heightened awareness

When participants faced heightened awareness about their health and wellness, they used mobile-mediated information for guidance and reassurance in various ways. Typically, females in this study conveyed their heightened awareness about various health concerns and sometimes they made other people's health concerns their concern. (See also "caring for relatives" in this category description in which I outline the role of information caregivers). Heightened awareness about health and wellness was worrisome to participants in general because the stakes are high when health concerns impact everyday life. In the context of health and wellness, concerns can literally be a matter of life and death. Although participants did not mention any medical emergencies, they did discuss surgery and other troubling concerns.

5.5.1.1 Facing risks to health and wellness

Several female participants conveyed their encounters with risks and how they used their mobile device for information to face these health and wellness risks. In this section, I refer to "risks" because participants anticipated outcomes. For example, Liz observes that dementia is prevalent:

> *Just, touch wood, you know, so many people out there get early dementia and stuff like that and, you know, that's a health issue that really concerns all of us. …At this age. And that's, as you see, not so much your friends yet, but a lot of their parents often and you think Oh God!... Epidemic levels almost now and you think wow!* (Liz)

The prevalence of early dementia troubles her, so she interacts with mobile-mediated information in a specific way. That is, she plays mind-stimulating games on her tablet computer such as Sudoku and Bridge:

> *to keep my mind turning over… [because] when you get to my age, you'll do anything. [We both laugh] You'll eat blueberries. They taste very good with memory. I happen to love blueberries!* (Liz)

Although Liz explained her health (and advanced age) concerns to me light-heartedly in this instance, her preventative action to reduce the risk of dementia was wholehearted.

In comparison, several other female participants encountered more immediate risks to health and wellness. Their heightened awareness about risky topical skincare products was pronounced in each of the three examples following. In the first example, Dee found the "black salve" to be a confronting health risk:

> Dee: *One of the guys at work, he's one of our consultants, he's all into the organic blah blah blah, everything natural, which I think is really great but he had a suspect spot on his arm and one of his people that he works with professionally said, "Aw, that's fantastic, you should instead of going to the doctor, you should, you should use black salve". And that was ewww!*
>
> Julie: I'm not even sure what that is.
>
> Dee: *Yeah, I didn't know what it was either and so he showed me. So, he had applied the black salve obtained from someone else and it had bubbled up and blackened the skin around it. There was this huge lesion and it looked terrible and it was like the size of my freckle and he was concerned that it was cancerous, so it was home preventative medicine treatment*

Although it was her colleague who used the black salve, Dee made it her concern. Her use of the expression "ewww" conveyed her repulsion, yet she felt compelled to watch YouTube videos about it on her tablet computer and suggested that I have a look at them (I did not because I believed her, and I am squeamish). Bubbled and blackened skin is ghastly imagery. Dee's repulsion was instinctive, and it alerted her to risk and danger. She told me unequivocally that "there's no way I'd go anywhere near black salve". Yet, she wanted to *see* more because she was drawn to the spectacle. The black salve was an unpleasant topic, yet she wanted to see it for herself which both alleviated her uncertainty and her shock (eventually). For Dee, information about the dubious product provided guidance and reassurance. This reassurance came in the form of validation because she confirmed her belief that it was a health hazard and debunked the quackery for herself. Also, it seemed that expressing herself in our interview discussion was cathartic and reassuring for her. In this

encounter, Dee used information in numerous ways to manage uncertainty and to influence her emotional feelings.

In a second example of heightened awareness, Shanna was alarmed by the prospect of carcinogenic chemicals in skincare products at the supermarket. She used her smartphone to verify certain ingredients ending with "paraben" because of her knowledge as a skincare consultant. She explained:

> *I Googled to look what they were and basically it flashed up bad, bad, bad chemicals you know. ...I look into health and wellness stuff that maybe I don't know what it means* (Shanna)

In short, she integrated personal experience with online information for guidance (clarification) about risky-sounding chemical ingredients.

While Shanna was wary of skincare products containing paraben, Nikita rejected the cortisone cream prescribed for her baby's eczema because she suspected that it was too risky to apply to his skin (which may be interpreted as following her instinct or intuition). She doubted her doctor's cortisone cream prescription, thinking to herself, "No, I'm not putting that on, you know, on my baby". Instead, she looked for alternative natural treatments on her laptop and eventually found a natural, organic cream online that worked. Like Dee and Shanna, Nikita used information for guidance and reassurance when facing risks to health and wellness. All three participants made it their business to know more about the respective skincare products they encountered even though neither the black salve nor the cortisone cream was intended for them personally. In each example, the participant rejected the skincare product and each participant felt reassured by confirming their doubts about the skincare product.

5.5.1.2 Facing hereditary health concerns

A few participants (Reg, Liz, Dee) voiced hereditary health concerns which increased their risk of certain diseases. This awareness of increased risk prompted them to act which entailed using mobile-mediated information in various ways. Awareness of hereditary health disease was part of their personal experience and on their minds.

Reg and Liz have a family history of heart disease. Hence, they were both aware of heart health:

Dad died young of a heart attack, so I've always been, sort of conscious in terms of food intake. (Reg)

I had my heart checked out because I had a history, my father died very early and we all decided, siblings at 60 would check out our hearts to make sure and check we didn't have a similar hereditary. (Liz)

For Reg and Liz, a family history of heart disease heightens awareness which prompts the monitoring of this health concern. Specifically, Reg was conscious of food intake and cholesterol levels. He also keeps his eye on health news via his smartphone to see the latest ideas on fat which he phrases as "fat or not fat". It seems that he not only faced heightened awareness about his health but also faced consumer uncertainty about the health-giving value of fat because of contradictory nutritional advice. Liz and her siblings get their hearts checked and Liz also checks the meaning of her test results on her tablet computer via online searching. She also shares with her brother via e-mail stating, "My brother [and] I both have similar health, hereditary health things. So, we often might share each other's latest blood test for example".

Dee was also concerned about hereditary disease. She has a family history of skin cancer, so she read government sources on her mobile device to relieve her uneasy emotions about spots on her face. Recently, her father had some carcinomas cut out of his face, "so, paranoid me wants to learn what I can". In a similar fashion to her encounter with black salve, Dee wanted to *see* information about skin cancer via her mobile device despite, or perhaps because of, the unpleasantness of the images. Additionally, while describing how she helped her father find information about his skin cancer concern she explained:

Dee: *Because it's, well, not only for dad's sake, dad's health but also for my own.*

Julie: Yep

Dee: *Because I'm concerned about*

Julie: For yourself?

Dee: *Yeah and it's hereditary as well because mum had one cut out when she was in her early forties and [my sister] had one cut out in the past two years. So, I was a little bit nervous about that.*

Dee's nervous feelings prompted her to research the nature of the disease via her mobile devices which she found helpful because she could see images of skin cancer. She could *see*

what she was facing. This example clearly demonstrates the cause and effect relationship between this category *facing uncertainty* and Category 4: *Doing my own research*. Dee does her own research because she faces uncertainty about her facial spots and uses her mobile devices to do so because she always has a device with her. The convenience of constant mobile connectivity supports her research which was her way of *facing uncertainty* in this instance.

5.5.1.3 Facing body weight concerns

Although several participants mentioned dieting, Richard was the only person who had the imperative to lose weight because of his job. He chose to use fitness and diet apps to manage his weight because he faced heightened uncertainty about passing his work medical. As a pilot, he is required to be within a certain body weight range therefore his health concern was a direct result of wanting to renew his pilot's licence rather than to avoid lifestyle-related disease or hereditary heart disease. Conversely, it is a certainty that he will fail the work medical if he is overweight which means facing an uncertain job future.

5.5.1.4 Facing unresolved health and wellness concerns

In some cases, participants' health concerns and the associated uncertainty did not resolve. For example, Ella experienced her unresolved health concern as feeling "left in the lurch" by her doctor which was a distressing experience. She felt recurring physical symptoms as well as shock and abandonment:

> *I had some recurring sinus infections and I kept going to the doctor and saying well that perhaps an antibiotic whatever preparation's not working for me. As soon as I finished taking it, a two weeks course, I got the symptoms again and can't live like this and I was really surprised that the GP said to me, "There's nothing more I can do for you". And I thought my goodness, really? Like so I'm just left in the lurch now, I've just got to find my own way?* (Ella)

Consequently, Ella finds her own way by looking for different health options via her mobile devices such as diets, nutritionists and accounts of other people's health experiences.

Nikita also doubts medical doctors and seeks natural health alternatives in general because of her personal experience. Significantly, in relation to her Premenstrual Syndrome (PMS) pain and nausea, both the health concern and the associated uncertainty did not resolve. She was against the idea of surgery but gave up hope of finding an alternative to surgery. Nikita's chronic, unexplained physical pain was alarming information that something was not right,

and this drove her to respond. She eventually resigned herself to exploratory surgery for diagnosis and relief recalling that:

> *I was just so fed up with the pain and just feeling sick from my hormones. I kinda [kind of] had just given up that there was any sort of other way yeah, things could be made better.* (Nikita)

In Nikita's example, bodily symptoms and emotions were entangled and she felt "fed up" by both. She found neither an answer nor a viable alternative to her health concern. Arguably, finding her own way included resigning herself to surgery and perhaps, the scarcity of information on the topic *was* meta information that indicated that little was known about the topic. However, it was not reassuring information for one living with an undiagnosed, unresolved health concern. Asked if the surgery was successful, she replied, "to a point. I'm not completely pain-free, you know, PMS syndrome free", which indicates that Nikita's health concern remained unresolved.

5.5.2 Relieving uneasy feelings

Facing uncertainty about health and wellness was often associated with uneasiness in mind or body, especially if participants faced long-term or unresolved uncertainty. Feeling uneasy, bored or troubled also encouraged participants to act by using information via their mobile devices. This section outlines the various ways participants relieve their uneasy feelings by engaging with information.

5.5.2.1 Looking for inspiration and hope

Although several participants sought motivation (for fitness routines in particular), and Nikita spoke about brightening her day by exchanging uplifting text messages with her friends, only one participant spoke of looking for inspiration and hope. Amelia sought inspiration and hope because she felt uneasy in body and mind. She was aware that she felt a bit unwell but was uncertain why:

> *I've got health issues that I can just never get to the bottom of… Yes, that's always played on my mind. I always feel a bit unwell. When I've eaten, when I wake up. Almost all the time, I'm feeling, like I have digestion issues. I don't feel 100 per cent.* (Amelia)

Amelia said that her unresolved health issues play on her mind and are in her "headspace", so they troubled her mind *and* body. She felt uneasy and uncertain of the cause which she "can

just never get to the bottom of". Consequently, she uses social media via her smartphone stating, "I can see a little bit of inspiration from wellness [which] gives me a little bit of hope that there might be an answer to these gut issues". She explained that, although she seeks inspiration, "I think the older I get, the more sensible I get about taking other people's advice". Amelia alleviates her uncertainty about an unresolved health concern by using information for inspiration and hope. In this example, she uses information to feel better psychologically rather than for medical advice.

5.5.2.2 Writing and documenting to feel in control

Unlike other participants, Amelia had a particularly strong urge to write and document personal information for her own health and wellness. She writes and keeps health and milestone records in her smartphone and in a baby book to feel in control which relieves her feelings of uncertainty and doubt about motherhood. This was her way of adjusting to a life-changing role. As a first-time mother, she preserves her daughter's personal records and milestones on her smartphone. Just knowing that the information was recorded made her feel more in control:

> Amelia: *I write everything down like even her weight. You know, first smiles. Skin loss. Weight, yeah from a month old. Sleeping, feeding patterns.*
>
> Julie: That's really detailed.
>
> Amelia: *It is. First time mum.*
>
> Julie: Yeah, that's amazing.
>
> Amelia: *Yeah, I don't know if child number two would get that kind of treatment. I think it gave me a sense of control of… a situation that I didn't feel like I had any control over.*
>
> Julie: Yeah, is it putting it in order or just knowing that it's there or what is it?
>
> Amelia: *Knowing that it's there.*

Amelia used the phrase "write everything down", and I viewed both her detailed writing as well as her record keeping as sense-making and comforting actions. She also writes to remember and to provide "a legacy" for the family and I understood that this also provided comfort. Amelia records her child's health information and milestones in detail on both her smartphone and in a hardcopy baby book for posterity. Asked why she uses both media, she responds that "in my phone is probably more dot points. Like little snapshots of information.

Whereas in the baby book it's this story. Different stories at different stages". Stories include the birth and first holidays. She was also inspired to create her own scrapbook pages on Pinterest with "food intolerance friendly" recipes as a personal resource for her gut issues (mentioned previously). Although Shanna was "hooked on Facebook" because she felt connected with friends when sharing photos of her life in South Africa, Amelia's urge to keep records and write for her own health was exceptional among participants. She engaged with information to create personal snapshots, stories and scrapbook pages to relieve her uneasy feelings.

5.5.2.3 Discussing health concerns with other females ("girl talk")

Female participants shared their health concerns and uneasy feelings with female friends or relatives via their mobile devices. This female-only discussion or conversation with friends who they already know can be described colloquially as "girl talk". Notably, there is no "boy talk" counterpart in this study, so it is an information experience specific to female participants who were more inclined to share emotional feelings with their friends. "Girl talk" is a kind of small talk that was not necessarily confined to female health concerns, it simply involves females talking and sharing with other females about health and wellness via mobile devices. This section outlines two examples of girl talk.

Charly and her female friends Google symptoms on their smartphones and talk about health concerns via instant messaging. She explains that in one instance, discussing her symptoms resulted in a group panic which prompted her to visit her doctor to get tested. Getting tested eventually relieved her intense emotions (specifically "panic") about her physical symptoms. Charly explains that sometimes the group of girls also discusses treatments for sporting injuries such as, "what other people have done in the past" about calf muscle injuries and whether to go to the doctor or the physiotherapist. I understood that discussion was of a practical, social and emotional nature. Charly elaborates that Googling symptoms can result in, "kind of panicking yourself, or panicking your friends if you're helping them". Asked if discussion makes people panic more, she responded:

> Charly: *Sometimes*
>
> Julie: Yeah, do you remember a time?
>
> Charly: *I'm pretty sure it was, we were Googling cervical cancer and I told myself I did actually have it, then went and got a pap smear and didn't have it.*
>
> Julie: Yeah. So, you scared yourself?

Charly: *But I told everyone I did have it.*

Julie: Yeah. And, did they think that you did?

Charly: *They did kind of panic a little bit with me. …They were like yeah, go and get checked.*

In this instance, Charly encounters several categories of experience: Category 2: *Feeling connected*, Category 3: *Facing uncertainty* and Category 4: *Doing my own research*. The relationships between categories seem synergistic in this instance because it is panicky feelings in a virtual group dynamic that prompt Charly to verify and resolve her health concern.

While panicky feelings in a group dynamic inform Charly, Nikita talks to her sister (Ella) about health risks via text messages. Her sister does a lot of research on health topics and sends her links to articles. Nikita said that she learned from one website:

> *Basically, that soy sauce is really bad for you. It creates, the way that it's made so quickly, creates its own kind of MSG [mono sodium glutamate] …in response to that, the soya sauce one, I think I wrote I don't know something really silly like, "Soy very bad!".* (Nikita)

Her sister alerted her to the health risk and Nikita made sense of the article by summing it up in three words in a return text message ("Soy very bad!"). Nikita's statement was simultaneously "silly" and sincere. She evaluated the health risk in conversation (which can be considered "small talk", "girl talk" or what I referred to as "silly talk" in a grounded theory memo). Whatever the label, the conversation was prompted by her sister, mediated by her smartphone and coloured by her difficult personal experience of hormonal issues.

5.5.3 Caring for relatives (being an information caregiver)

Facing uncertainty includes caring for relatives who face uncertainty or unease about health and wellness (see also "Sharing and caring about elderly relatives" in Category 2: *Feeling connected*). Most participants believe that caring for people in their lives was important and this includes family members from older and younger generations. Consequently, certain participants assume the role of what I refer to as an information caregiver. This does not necessarily equate to assuming the role of dedicated carer (although the mothers of young children in this study are primary carers of their children). Rather, it simply means that part of their information experience includes searching for information on behalf of their relatives.

Information caregivers in this study include mothers of school-aged children or younger, namely Nikita, Amelia and Shanna. Ella, Dee, Reg and Liz also care for their respective relatives. These participants provide insight into strategies for caring for relatives and although information actions vary according to respective situations, the motivation to manage uncertainty about health and wellness concerns is similar.

5.5.3.1 Providing health information for relatives

Several participants provided health information for relatives. For example, Ella helped her mother with health information using her own smartphone stating that looking for the cause and treatments of lupus "would probably be too overwhelming for her [that is, Ella's mother]" because "she feels comfortable with going with what her doctor said". I inferred that Ella's mother feels uncomfortable with health information *not* sourced from her doctor. However, her mother did take Ella's advice to stop taking fish oil capsules before undergoing surgery because of the risk that "it will prevent blood clotting". Ella was also concerned about her primary school-aged nephew's health, so she sent specific children's health information to her sister via text messages explaining that:

> *He's got a bit of asthma, so there's a lot of research that's showing that milk isn't necessarily good for asthma or having chest infections, coughs like that, so I might send something to do with that.* (Ella)

Ella states that her sister (Nikita) decides for herself what information is "reasonable", so I understood that Ella sees her role as providing awareness which her sister "appreciates". Ella also looks for nut free recipes online for his school lunches because her nephew has a peanut allergy. For her, *facing uncertainty* entails caring for her relative's asthma and allergy risks and this overlaps with *feeling connected* (Category 2) and *doing her own research* (Category 4). It is *because* she cares (that is, she is concerned) for her nephew that she connects with her sister and researches children's health via her mobile devices.

In another example of providing health information for a relative, Liz searches for information on a cholesterol reducing pharmaceutical drug for her husband and her own awareness:

> *there's this whole debate going on and of course Statins is something at our age. Like I don't have high cholesterol but [my husband] does or has… So, he was on Statins for a while and then he took himself off. So, you know, there's those sort of things that come up with your own health and with lots of our*

> *friends are similar age and we often, you know, sit around at dinner parties and talk about Statins. Very boring at dinner but it comes up. So lately in the press there's been a lot of stuff about it and so… we'd go on, both of us probably, but more so me, would go on and read a bit more about Statins and side effects*. (Liz)

Liz states that Statins is "something at our age". The drug was a topic of concern and discussion in her social circles because people of a similar age (over 60) face uncertainty about their cholesterol. She takes the lead as an information caregiver in the marriage because, as she states, "he doesn't want to do it". Note that Liz does not even have high cholesterol. Rather, her husband's health and wellness concern are her concern.

Dee is also an information caregiver who provided information for her parents at a "very nervous" time. Her father's health concern was also her concern, so she did her own research for the family:

> *when my dad had some surgery about six to eight months ago and it was for, he had a stent put into his artery in his lower chest and it, we were all very nervous about it, so I did my own research about the procedure*. (Dee)

Dee found information from a website that explained the procedure, "in a non-threatening way… so it wouldn't get people who were reading it concerned. It would just explain the procedure gently, I guess". Dee sought gentle, reassuring information via her mobile devices.

Personalising and providing health information for her parents required double-checking medical advice and procedures associated with her father's surgery. She evaluated the online information for her parents before handing them paper print outs because she knew that they would respond better to printed material. Information caregivers research information for relatives unable to search (or those who are not interested in looking). Dee was more willing and able to research than her parents stating "I think it's just that generation, they don't explore beyond a certain, I don't know, range. And they don't know how to because it's very new". By "new" she meant both mobile devices and online searching. The format and manner in which Dee provided information for her parents were important because they were integral to her strategy of relieving uneasy feelings and softening the harshness of the situation.

5.5.3.2 Caring for children

Mothers in this study cared for their children by engaging with information in diverse ways. This caring involved heightened awareness (which was often worry) about their child's

current or future health and wellness as well as their whereabouts. Sometimes, caring and relieving uneasy personal feelings intertwined in the same actions. For example, as a primary caregiver, Nikita was conscious of hormones in her son's food and did not want him to develop "man boobs" (enlarged breasts on males). I understood that Nikita's personal experience of hormonal issues intensified her feelings of unease about her son's health and nutrition:

> *I don't want him to go through that hormonal stage earlier than he has to and one of these other articles I was reading about was like how young kids being overweight impacts their organs having to work harder when they're younger. So, when they're actually older it's almost like they've used their organs a lot harder already. And yeah just wanting to give your kids the kind of best start in life as you possibly can. Giving them healthy, like healthy eating habits.*
> (Nikita)

Nikita considers her son's eating habits to be her responsibility, so she reads information on her smartphone for guidance. This external information, combined with her difficult personal experience, both heightens her concern and strengthens her resolve to give her son the best nutritional start in life possible.

In comparison, Shanna's concern about her primary school-aged sons extends to their safety and her own feelings of reassurance. In other words, she simultaneously cares for her sons and relieves her uneasy feelings (worry) by seeking reassuring information via constant connectivity. Shanna's experience was unique in this study because no other participant mentioned being a primary caregiver to a child who owned a mobile device. This study did not focus on whether using mobile technologies make children feel reassured. However, Shanna indicated that she and her son were comfortable and amused about e-mailing during school hours. She describes both the context and the character of the e-mail messages:

> *So, my eldest son, he's a bit naughty. He e-mails me from school all the time. "Hi Mum!" ...And then he'll half an hour later say, "Hi Mum", again "why aren't you answering?" And he'll get back from school and I say, "you're not supposed to be e-mailing me about nothing". So, I suppose, yeah, because he's got a phone and whatnot, I can track him down and keep an eye on them.*
> (Shanna)

"Nothing" e-mails were really something because they were meaningful to mother and son and Shanna apparently felt a combination of annoyance, amusement and reassurance. Keeping mobile contact was likened to keeping an eye on her young son.

5.5.4 Living well with risk and uncertainty

Being healthy and living well are subjective concepts that meant something different to each participant. However, there was some consistency to the experience. For example, for participants with unresolved health concerns, living well meant living as healthily and well as possible in their personal circumstances. For Nikita, it was easing pain and avoiding disagreeable food and disagreeable aspects of mainstream health such as soy products and cortisone cream (which is part of her strategy of eating well and getting well). For participants with hereditary health concerns, living well was about monitoring and preventing the disease. In each of these examples, participants found their own way of living well (or as well as possible). In other words, finding their own way *was* a pathway to living well.

Ella explained that she had to find her "own way" after being "left in the lurch" by her doctor when he said he could do nothing more for her. Finding her own way involves seeking different options and the advice of nutritional experts. Ella was also an information caregiver and these participants make it their business to care for their relatives' health and wellness which in turn makes them feel reassured personally. Looking after relatives is their way of living well as a family. In each of these examples, participants were finding their own way of living well with risk and uncertainty which involved *Going mobile for health and wellness*.

5.5.5 Summary

When *facing uncertainty*, female participants in particular used information for practical and emotional support, to manage risks and to alleviate their heightened awareness about health and wellness concerns. Feelings of uncertainty and unease are highly significant because they prompt participants to do their own research (Category 4) and, additionally or alternatively, to seek social support and connection (Category 2: *Feeling connected*) and, additionally or alternatively, to diet and exercise (Category 5: *Motivating myself*).

5.6 CATEGORY 4: DOING MY OWN RESEARCH

In Category 4: *Doing my own research*, participants seek and integrate information relevant to their health and wellness concerns. Participants use external information via the mobile Internet and internal information such as their personal experience and their preferences. In this category, the most frequently used external sources are accessed online using the Google search engine. Participants also valued in-person medical advice from their doctor as an external information source. However, they often integrated information from the mobile Internet and personal experience with this advice.

Aspects of *doing my own research* include researching in everyday life, preparing for a visit to my doctor, double-checking medical advice, self-diagnosing, seeking alternative health and wellness options, feeling overwhelmed by health information and referring to my personal experience.

This category was mostly experienced by female participants because they want to know more about their own concerns and everyday health and wellness in general. They want to know more about their own concerns *and* more in comparison to their male counterparts. *Doing my own research* is an *in vivo* code phrased by three participants (Nikita, Ella, Dee). Several more participants (Miles, Liz, Amelia) use the term "research" to explain their information experience of searching online for health and wellness with their mobile devices. Participants also use related terms such as "search" (Ella, Miles, Charly, Liz, Shanna), "check" (Liz), "double-check" (Charly), "look up a bit of medical information" (Shanna), "understanding" (Dee), "judge" and "judgement" (Charly and Ella respectively), "thorough" and "just Googling" (Ella) and "just Google" (Charly, Liz, Shanna). Research can range from using the smartphone browser to Google how many avocados should be eaten per day (Miles) to complex, long-term research about health concerns that involves information from multiple sources via the mobile platform (Nikita, Ella, Liz).

5.6.1 Researching in everyday life

Participants experienced doing their own research as part of everyday life. Researching in an everyday life setting was informal and more personal in nature than engaging with peer-reviewed research in an academic context. Amelia notes that, "I call it research but, it's not peer reviewed. Just articles on different findings, different health things to do". Amelia was aware of the distinction between peer-reviewed research and information searching that is

referred to as "research" in this study because she works as a researcher for a government department. However, like other participants, Amelia's research about her own health concerns was personal and specific and not peer reviewed. As a mother of a toddler, she is a caregiver and information caregiver. Other participants also assumed this role which means that they monitor the health of family members. Essentially, the health concerns of their relatives are also their concerns.

As a teaching assistant, Nikita's care extends to children at school. She works with children with behavioural difficulties such as autism spectrum disorder and did her own research, so she could relate to the children better. Nikita's personal/work information interests were blurred when she read the news on her smartphone for relevant articles. She states "so, if I came across newspaper articles that had anything to do with behavioural issues, I'd always read those, and I used those to do my own bit of research". Health and wellness concerns were information *per se* that alerted and motivated caregivers to research. Personal health and wellness concerns motivate the two main actions in this category. These actions are seeking health and wellness advice and seeking alternatives to follow (which entails options both within mainstream health and from alternative health). Participants seek guidance of some kind in both actions.

5.6.1.1 Trusting and mistrusting information

Although beliefs, opinions and approaches vary, trustworthy information was paramount to participants when doing their own research. For example, double-checking medical advice is a way of verifying information and Dee, Charly and Shanna consider Googling via their mobile devices to be useful, although Dee was aware of self-diagnosis concerns and Charly sometimes double-checks her symptoms by visiting her doctor. For participants, *doing my own research* in everyday life was often guided by what I consider to be healthy scepticism because they filter out less reliable and/or less desirable information. For example, when searching online for health information, Liz evaluates Google hits "by attrition" which suggests that she sees it as a process of elimination or whittling down hits:

> Julie: how do you decide which one that you're going to look into?
>
> Liz: *Well, I don't really, I read them, and I find, and I try to find a common thing that's coming through on all of them. …So, where there's one that's just way out that doesn't sort of relate to any other one, it's more by attrition than by actual source.*

The "common thing" and "overall feeling" guide her search for suitable information:

> *I sort of try to get a middle ground. I'm not looking for something that's standing out that's different that I'm going to go "Aw, aw maybe that's right or whatever". So, I'll try to just get an overall feeling of several.* (Liz)

Liz compares information and looks for information that is in-between opposing sides. The "middle ground" suggests that she was looking for moderate rather than controversial information and she filtered out information that seemed extreme. It is difficult to interpret Liz's precise meaning without specific examples. However, it is clear that she has developed an approach to doing her own research from her personal experience, preferences and "overall feeling". Her approach includes trusting her doctor and medical journals for medical advice and she states that "*The Lancet* is a medical journal that I would research, I would probably use as my Bible I suppose". Liz explains that her father was a doctor and there was always a hard copy of the medical journal *The Lancet* in their house. Revealingly, it is a family tradition to trust in this publication and Liz accesses it from her tablet computer these days.

Although doctors were valued health information providers, in some examples, participants trusted people with shared experience as an alternative or in addition to healthcare providers with qualifications. For example, Miles trusts his gym coaches for both fitness advice and treatment recommendations such as trigger point therapy. For participants, visiting their doctor is *not* considered to be doing their own research although their doctor is considered an important information source, that is, for medical advice. Rather, participants do their own research by preparing for a visit to their doctor, double-checking medical advice and self-diagnosing.

5.6.2 Preparing for a visit to my doctor

Some participants Googled information via their mobile device in order to ask more educated questions during a medical consultation. The aim is to optimise their time with their doctor who is typically time-poor as Dee asserts:

> *I think there's a lot of concern over the self-diagnosis through Google, but I also think that it's good to have a lot of information at your fingertips to also provide a level of complete understanding because I think we have this strong reliance on the medical professions and when you're with a professional*

> *you're only there a really short period of time, so trying to get a good understanding and knowing what to ask* (Dee)

After acknowledging concern about self-diagnosis via Google, Dee explains the value of researching for personal awareness and understanding which supports more informed and articulate interaction with medical professionals.

5.6.3 Double-checking medical advice

Double-checking describes how participants used more than one information source for medical advice. Checking may occur before or after visiting a doctor. Liz explains:

> *I guess I'd use it as confirmation of what I've already been told [by her doctor] I suppose. Or if I want to find out slightly more. More often than not in a doctor's surgery you might not pick up everything and you go away, and you think, "Aw, I wished I'd asked them that or I wished I'd asked them that".* (Liz)

Liz regrets not asking questions at the doctor's surgery because she could not grasp all the details at the time. Liz double-checks her doctor's advice for confirmation and to learn more. Charly has a different approach because rather than double-checking her doctor's advice, Charly goes to the doctor to double-check her symptoms:

> *I had some showing issues that could lead to going to the doctor's. Without going to the doctor's, you can still search using Google… I still like to go to the doctor's, just to double-check.* (Charly)

Charly used the euphemism "showing issues" when referring to symptoms that may indicate sexually transmitted disease (STD). The euphemism sounds and feels less harsh and using Google to double-check was reassuring for her in a difficult and sensitive situation. Charly also exchanges instant messages with her female friends about symptoms stating that "it's kind of peace of mind" which indicates that connecting with friends is an alternate or additional way of double-checking (or triple-checking in some instances) which provides psychological comfort. For her own peace of mind, Liz recounts how she checks her heart and double-checks (or triple-checks) her medical test results on her tablet computer:

> *I had my heart checked out because I had a history, my father died very early and we all decided, siblings at 60 would check out our hearts to make sure and check we didn't have a similar hereditary. So, some of the results coming from*

that, I wanted to research a bit further. …One of the tests said zero calcium which was supposedly a really good result. So, I went on to check that. (Liz)

In this example, Liz proactively integrated information from multiple sources. First, she uses her personal experience (in this case, family medical history) because she knows her father and his brother died "very early" (at 60) and this health concern prompts her (as well as her siblings) to get tested. Second, she gets test results. Third, she researches the meaning of her good test results on her tablet computer because she wants to double-check the meaning of zero calcium. Liz effectively triple-checks her heart health.

In a few cases, participants do their own research about the health concerns of a family member via their mobile devices. Liz also double-checks medical advice that her husband has high cholesterol by reading media about Statins, a cholesterol reducing drug while Dee double-checks medical advice and surgical procedure via her mobile devices when her father had surgery.

There is a causal link between Category 3: *Facing uncertainty* and this Category 4: *Doing my own research*, that is, uncertainty about their own health, or that of a relative, prompts participants to do their own research which means participants experience both categories simultaneously. For participants, it is not always clear when (or if) uncertainty ends or when *doing my own research* ends because they both can be long-term for some participants. The research can be ongoing because health concerns can be long-term and remain unresolved. Additionally, in some examples the process is reversed when *Doing my own research* triggers feelings of uncertainty. For example, Ella felt overwhelmed by information overload which is discussed later in this category.

5.6.4 Self-diagnosing

Participants' views on self-diagnosing varied. For example, unlike some participants, Liz's stance on self-diagnosis was resolute:

Julie: So, usually your order is to go to the doctor first?

Liz: *Absolutely*

Julie: And then get information?

Liz: *I would never try to self-diagnose myself through the Internet. …Just because in education, I'm aware of girls [at the secondary school that she*

teaches] going to Internet sites and really going "this is the Bible, this is it". ...So, I'm sort of a bit wary of that as a primary source.

Julie: OK, so you've observed students that do that?

Liz: *Yeah, a lot of young people coming through now just think that Google or Wikipedia that is absolutely everything there is absolutely true and correct which is not, we know, is not correct.*

Liz believes in medical science, trusts her doctor and was against the idea of using the Internet for self-diagnosis. She was also wary of using it as a primary source in general and cites examples of her students trusting Google and Wikipedia implicitly. In comparison, Dee was shocked by her colleague's self-diagnosis and self-medication:

so, he had applied the black salve obtained from someone else and it had bubbled up and blackened the skin around it. There was this huge lesion and it looked terrible and it was like the size of my freckle and he was concerned that it was cancerous, so it was home preventative medicine treatment, self-diagnosis. Complete self-diagnosis! (Dee)

From the excerpt, it is evident that Dee was shocked by the sight and the self-diagnosis (which she states twice for emphasis). Her encounter with the black salve is discussed further in Category 3: *Facing uncertainty*.

In contrast, some participants Google to self-diagnose *instead* of visiting their doctor if they perceive that their health concern is minor (as opposed to what Shanna refers to as "something major"). Shanna explains that "sometimes if you get a little niggle somewhere, you self-analyse on Google" and adds that if there is something wrong with one of her children, "I probably have a little look first [on Google] …and then I would go to the doctor if I think it's something major". Similarly, Charly describes how she will often "just Google" to self-diagnose, stating that if she has a cold, she will Google symptoms online such as "middle ear infection" because there are many types of colds with varying degrees of seriousness. "So, from these symptoms they [that is, Google search results] can kind of tell you the best remedy". In comparison, Miles explains that when he had shortness of breath, he "literally typed that in followed by WebMD and just read through the results". He was able to research symptoms as he experienced them because of the convenience of constant mobile connectivity. (See also the first aspect "Experiencing constant connectivity" in Category 2: *Feeling connected*).

5.6.5 Seeking alternative health and wellness options

Participants used information to seek and follow alternative health and wellness options for everyday health and wellness pursuits as well as for specific health concerns. These "options" may be in mainstream or alternative health. Sometimes participants use a combination of both. Miles explains:

> Miles: *I would search, you know, why a certain part of me is sore and how to fix it. Using trigger points… I'll basically I'll type in "trigger point foot". …And it will tell you where the trigger points are…and use those diagrams to try and massage myself. And, it has definitely helped.*
>
> Julie: It's like self-therapy?
>
> Miles: *Yeah, exactly. I used to get a lot of physio. I'll go occasionally but this helps.*

While Miles used mobile-mediated alternative health information in combination with his physiotherapist, Nikita revealed that mobile-mediated health information provides alternatives where mainstream health falls short. In the following, she uses mobile information instead of consulting a doctor, that is, she is doing her own research for alternatives to consider because she finds her doctor's advice to be lacking or inadequate. Asked if she thought her smartphone was her preferred way of accessing health information, she replied:

> *Yeah, definitely 'cause [because] I don't really see the GP [general medical practitioner] as somebody who is going to give me an alternative, you know, and so they're, you go to a GP and they're kind of well you can take this script [prescription], or you should be exercising more, or you shouldn't eat this, and they haven't actually given you a plan, you know something you can follow.* (Nikita)

Nikita needs a specific plan to follow, so she seeks alternative plans to mainstream health via her smartphone such as the endometriosis diet. Amelia also uses alternative health information from alternative sources (to mainstream health) via her smartphone. For example, she follows another mother's blog on Facebook because the blogger is a mother who also experiences food intolerances and therefore Amelia identifies with her on both fronts. The blogger is a trusted source because of shared experience rather than by

qualification and Amelia follows her "nurturing" recipes. To find alternative nutritional advice, Ella integrates information from multiple sources stating, "I kept up with doing my own research, so a bit of it on my phone, a bit of it on my laptop and a bit, and a lot actually from that book. It's very thorough, a bit of radio too". Asked how she knows if the information or advice is good or right, Ella responded:

> *I did some through university studies biology, biochemistry, just knowing about the body and sort of what makes sense. I can kind of, that helps me to judge whether this kind of sounds right what this person's saying.* (Ella)

When seeking alternative health and wellness options, Ella used her knowledge from her studies of biology and biochemistry to judge and make sense of advice from various media.

5.6.6 Feeling overwhelmed by health information

Several participants felt overwhelmed by health information when doing their own research. Finding specific health and wellness information from vast amounts of information online requires some strategy. While Liz evaluates online sources "by attrition", that is, by whittling down the search results, Ella felt overwhelmed by a mass of virtually unlimited information:

> Ella: *sometimes I find all these articles and I feel quite overwhelmed with all the information that I always have on Safari because… I think you can have up to twenty-four pages open and almost always …at least 80 per cent of it is health stuff.*
>
> Julie: Yep, 80 per cent did you say?
>
> Ella: *Yeah, 80, 85 per cent and I yeah that's how overwhelming it becomes like I, and if I want to look at a page to look at something say read it all and say and look at it all to see how important is this? Do I want to save it to my home screen? Do I just want to forget about it?*
>
> Julie: You have to evaluate it along the line?
>
> Ella: *Yep, and so the overwhelming part I think is a negative and there's days where I've actually had to say to myself "OK I'm not going to look at any health stuff anymore" because you know it's just too much to sort around and think about.*

Ella used the words "overwhelmed" and "overwhelming" several times in the passage because she cannot process or evaluate the vast amount of information and she is not sure what to do with twenty-four virtual pages of "health stuff". Even sorting or organising this information became a burden. When she was overwhelmed by mobile-mediated information choices, Ella simply stopped looking. Like Ella, Amelia has also learned lessons about access to excess information as well as not following her instinct. She laments not listening to herself and her daughter more:

> *Working in research, I have so much information at my fingertips. I know how to access it. I do far too much research… like before I conceived her [my daughter] and when I was pregnant, we had quite a few issues during pregnancy. …So, I think I read into them more than I should have done. …And when she was born, I think if I'd stopped reading, and just stopped and listened to her and myself, it would have met both of our needs a bit differently. …So, I think it definitely takes me away from instinct.* (Amelia)

Amelia refers to feeling overwhelmed by a mass of mobile-mediated information in a slightly different way to Ella. Both experience information overload, but Amelia became hyper-aware of the risk and dangers during pregnancy from "far too much research". She has learned from this intense experience not to read too much information and not to read too much *into* that information. She values trusting her own instinct and does not want to overthink which indicates that her instinct is an internal source of information that guides her in her health and wellness pursuits.

Amelia was the only participant to use the word "instinct" however, Ella used the term "intuitive sense" to describe how she knows if food is good or right for her by observing her bodily reactions after eating certain foods. For example, she links feeling less energetic and "a little bit achy" to eating wheat in pizza. Ella integrates her observations with her everyday biology, biochemistry and food research via her mobile devices. Browsing and researching for health information via her mobile devices is ongoing and both Ella and Amelia rethink their approach to living well with a mass of information at their fingertips.

5.6.7 Referring to my personal experience

Referring to personal experience was a theme in this study that was very clear in this category. When doing their own research, participants rely on their personal experience which includes prior learning, personal history and personal preferences. No participant has a

professional background in medicine, so their personal experience is limited in everyday medical matters. Participants refer to their personal experience, nonetheless. Ella uses her university experience of biology and biochemistry and Amelia uses her skills as a government researcher to do her own research. Personal experience includes family background and Liz told me "I am from a medical background initially. My father was a doctor". This influenced her trust in medical sources and her mistrust of the Internet as a primary source for self-diagnosis in particular. Personal experience also includes personal health background. For example, Liz has a history of heart disease in her family which means she faces greater health risks because of this hereditary disease. She states that, "I had a history of a grandparent, my own father and his brother all collapsing and dying literally at 60". Liz's family history informs her. I understood that her concerns motivated her to get tested, partly because of need and partly by preference.

When doing their own research, participants often know and follow their preferences which is discussed further in Category 1: *Knowing myself*. For example, Nikita prefers to follow alternative health options using mobile information because, in her experience, doctors did not provide her with a diet and exercise plan to follow. In comparison, when Miles decided to self-treat his muscular pain with trigger point charts on his smartphone, his personal experience of physiotherapy treatment was a basis of comparison to trigger point therapy. The doctor's advice, or lack thereof, also provides a basis of comparison for Nikita.

Participants often do their own research for reassurance and comfort. This is a particular way of responding to *current* personal experience of discomfort. Liz compares her health and lifespan to her family members and was comforted by her good "zero calcium" test result. In comparison, Nikita used information to feel more comfortable about her surgery:

> Julie: So, before your surgery did you use your smartphone to find information about it?
>
> Nikita: *Yeah, I did especially about the laparoscopy even though like you know the doctors at the hospital gave me some information.*
>
> Julie: Like printed out sheets?
>
> Nikita: *Yeah, and you know they drew a picture and, "OK this is where you'll get, we'll do the little incisions", and that sort of thing. I kinda [kind of] just felt like I wanted to research more to feel a bit more comfortable with what was going to be happening.*

Nikita did her own research for both understanding and reassurance about surgical procedures. She felt she needed more information than the doctors provided which prompted her to read official online government sources via her smartphone. Based on her personal experience, she considered these sources to be trustworthy.

Shanna also did her own research for reassurance. The possibility of bad chemical content in everyday products at the supermarket more than concerns her, it *alarms* her. Working for a skincare product company makes her more aware of health issues relating to skincare products in general and she explained how this personal experience coloured her consumer health information experience:

> *we learn in our business about bad chemicals that are in skincare. …And every now and then I chat with my mother-in-law, I pick up just about every day, lotion that you buy at the supermarket and you know the print, the tiny little things that you can't read anywhere? And I thought "Aw, should have a look at these". Because they tell you about all the bad ingredients in everyday stuff* (Shanna)

Shanna's awareness intensified because of her knowledge, so she researched the meaning of the small print or, in her words, "the tiny little things that you can't read anywhere". She did her own research via her smartphone and identified bad chemicals in order to make informed choices as a consumer. Note that the small print on the lotion was information that alarmed her, and she validated her concerns with online information. Her personal experience (which includes chatting with her mother-in-law) influenced her consumer experience and her information experience, and these experiences have all intertwined in this instance.

5.6.8 Summary

Participants often do their own research using the Google search engine via their mobile device in response to their health and wellness concerns. Research was for double-checking medical advice as well as for seeking alternative options. Participants integrate external information from the Internet with internal information sourced from their personal experience and preferences for practical support and emotional reassurance.

5.7 CATEGORY 5: MOTIVATING MYSELF

In Category 5: *Motivating myself*, six of the twelve participants in this study experienced the phenomenon as using their mobile device to motivate their fitness routine for health and wellness. In this category participants continually integrate internal and external information to motivate themselves. Internal information typically includes feelings, both physical and emotional and personal preferences. Feelings motivate participants and often, exercise was "about feeling good" (Reg) physically, emotionally and psychologically. Participants were also motivated to exercise to lose weight (Richard, Reg), to gain weight (Miles), to keep cholesterol down (Reg) and to "feel motivated to do other stuff" (Liz). On the other hand, participants also exercise to avoid feeling "lackadaisical" (Liz) or feeling "really sad" or "really guilty" because of lack of exercise (Miles).

Aspects of *motivating myself* are feeling good about my routine, "kickstarting" and keeping committed, enjoying novelty, tracking and benchmarking, "chipping away", following directions, using app features selectively and sharing success selectively. These aspects interrelate and overlap, for example enjoying novelty is a specific way of feeling good about my routine while "chipping away" is a focus on incremental change that participants track with their mobile apps.

Mobile devices support fitness and diet routines by providing external information such as voice prompts and energising music (Dee, Richard) as well as motivational podcasts (Dee). However, tracking fitness and diet routines was the most significant way of using mobile-mediated data in this category. Participants use mobile apps (short for "mobile applications", a term that participants used less frequently) or wearable technology and the tracking function both informs and motivates them. For example, by tracking, participants know their location and how far they have run using GPS (Global Positioning System) (Miles) as well as the physical and mental effort required to walk 10,000 steps (Reg). They can also see "a real snapshot" of fitness progress (Richard). Participants value current, accurate and visual fitness data.

Likewise, tracking *diets* entails current, accurate and visual data. Calorie counting promotes visibility and awareness of how much energy is in food in order "to make better choices" (Richard). Tracking meals encourages a "more disciplined" approach to dieting (Dee) and conversely, more discipline supports awareness of the caloric and nutrient value of meals. In

this category, participants mostly motivate themselves to *exercise*. However, Richard and Dee also used a food diary app to improve their meal planning and diet.

5.7.1 Feeling good about my routine

"Feeling good", physically, emotionally or psychologically, is both a subjective term and a subjective experience. When exercising, participants were motivated by both novelty and routine, endorphin rushes (Reg), zoning out and pumping up their personal playlist (Richard) and enjoying peace and quiet with their wearable technology in the outdoors (Shanna). "The physical rewards" of feeling fitter also motivated them (Miles). Essentially, "feeling good" is both a motivator and an indicator of participants' fitness and diet routine success and a goal *per se*. Motivational factors are highly individual. Feeling good or bad is personal because feelings are inherently personal. For this reason, *motivating myself*, is closely related to Category 1: *Knowing myself* because knowledge of self-motivators guides personal fitness and diet routines. Participants know that regular exercise and eating well makes them feel good and that these lifestyle factors are a fundamental part of living well. With the support of their mobile apps, participants were self-motivated and self-regulating in their routine.

A combination of intrinsically and extrinsically motivating factors influenced participants' routines. That is, they were motivated innately from within and they were also motivated by external factors such as their apps. Richard's job provides external motivation through its requirement that he be within a certain body weight range. This imperative was unique in the study. Although Reg exercised to lose weight, it was for his own personal health and wellness. Like other participants, he talks about feeling good when he reflects on his morning walking routine: "you've got your endorphins, you've done all that, you can get on with the day". Endorphins as feel-good hormones are a natural, intrinsic motivator and Reg also feels satisfied that he has completed his exercise for the day. For Reg, feeling good is a goal in itself and he relies on his app to confirm his walking efforts as he describes:

> *I seem to think, well, that's 10 kilometres I racked up. So, it's about feeling good. You're feeling good anyway, but your app is actually going to tell you're actually doing this amount etcetera.* (Reg)

Exercise also makes Liz feel good although she does not require extrinsic motivation to exercise because for her, exercise *is* routine and intrinsically motivating. As she states, "it's just a way of life. It makes me feel better". From Liz's experience of exercise being a way of life, it seems that intrinsic motivation also includes beliefs, inner drive, ritual and routine.

Clearly, intrinsic motivation involves feelings (physical and emotional) because Liz observes that "when it becomes a way of life with you, if you don't do it you sort of feel, sort of lackadaisical" and "ugh!" (which I understood to mean awfully lethargic).

Miles also laments that he feels the adverse effects of not visiting his gym enough stating, "I can choose to go less often. …But, when I don't go I just, I get really sad". Feeling sad or sedentary also motivates reflection and action. For example, to avoid feeling "really sad" or "really guilty", Miles visits the gym regularly. In motivating themselves to pursue their routine, participants need to know their personal, hedonic motivators. That is, what feels good or bad to them as well as more nuanced feelings such as feeling "fairly determined" to lose weight and the "disappointment" of not losing as much weight as expected (Richard), feeling "quite obsessed" about various apps and fitness magazines (Dee) and feeling "close" in a gym community where "you tend to know everyone" (Miles).

5.7.2 "Kickstarting" and keeping committed

Participants used their mobile devices in various ways to both start and maintain their routine. That is, to kickstart and to keep committed to their fitness and diet routine goals each day and longer-term. For example, Dee explained how she uses fitness information to activate or "kickstart" her exercise routine and music from her app to keep committed:

> *I'm quite obsessed with looking at various apps and fitness magazines. So, I always like to download the latest fitness-related app to see if it's going to help kickstart my fitness again.* (Dee)

To "kickstart" literally means kicking a pedal to start a motorcycle engine. Note that Dee described herself as "quite obsessed" which indicates her intensity when looking for fitness news and apps. To keep committed to a routine, she uses music as a morale booster as she explains:

> Dee: *So, I have my playlist, My fitness playlist.*
>
> Julie: OK. Is that just music that you like to listen to when you're exercising?
>
> Dee: *Yeah, it keeps me happy and motivated. Yep.*

For Dee, happiness and motivation merged in this instance. Similarly, Richard uses his apps for music to make exercise "less boring" which both kickstarts him on a walk and encourages him to stay committed to that walk as he recounts:

> *I have a playlist called "exercise" which is music that pumps you up as much as I can. That's great 'cause [because] you can just zone out and off I go. Otherwise, I'd walk, and I'd be thinking I'm a bit bored and I'd turn around and go back.* (Richard)

Pumping up was like kickstarting because it was about energising mentally and psychologically. Zoning out was different, it was more about Richard's mind going into autopilot while his body ran the course. No other participant described it exactly this way although Shanna likes quiet time when running and she also explains that before sleeping at night, she will "escape" the events of the day by seeing "what everyone else is up to" on Facebook via her tablet computer. By "everyone", she means her friends and extended family. "Escaping" and "zoning out" both imply a dissociation or deliberate disconnect from reality by connecting via mobile devices. Interestingly, music from Richard's app supports both pumping up *and* zoning out whereas Shanna explains that she does half marathons without music because as she states, "I just like peace and quiet". While Dee's music keeps her happy and motivated, Shanna finds the combination of peace and quiet motivating. She likes "admiring the outside" when running which means she runs to a mix of mobile technology and outdoor scenery when training. On the other hand, Richard knows he needs pumping up. Also, he observes that his exercise and diet apps are, "like having your own background personal trainer", because he sees them as "background" help rather than a face-to-face person.

Unlike Richard, Miles did not have a personal trainer (real or virtual). However, he states that, "the community or the gym I go to is quite close I guess in that there's always coaches walking around and helping out". Miles keeps committed to his routine because he feels supported and motivated in his gym community. This is Miles' trusted inner circle where he learns from his coaches and logs his workout in detail using his WOD (Workout Of the Day) app. He logs advice from his coaches and observations from workouts in his app, so he can refer to his logged notes later:

> *I'll look at my phone and think "Oh, last time I did deadlifts I did 100 kilos and then I look at the notes and that will say but I need to keep my back a bit straighter or something like that. Move my shoulders back".* (Miles)

Goal-setting also keeps participants committed to their routine. Miles needs precise information to perform his routine to meet his fitness goals and both his gym community and

his smartphone support this routine. His goal is to be invited by the head coaches to join competition classes. For Miles, an invitation from his head coaches was both a motivator and an indicator of his fitness routine success. In contrast, Richard's goal was to meet his workplace weight requirements via diet and exercise, and he knows he needs pumping up and "a bit of a poke and prod to get going". His fitness app performs this role as he states, "with the app I just found it sort of set the targets and then even though I might not have been enjoying it, I knew that was the next target to meet. So, that was good". He also reports that, "I did notice that it was a lot better for me just health wise and how I felt", and this also keeps him motivated. Richard's goal-setting targets keep him committed, and so too does feeling good physically and psychologically.

While Richard accepts that he will never be a triathlete, Dee *is* a triathlete who maintains motivation by listening to an inspirational role model via podcasts on her mobile device. She told me:

> *I got addicted to a guy who is a triathlete. …So, his was all around mindset. …Being a healthy active person. Not specifically being around being a triathlete, just being a healthy person.* (Dee)

Dee's exercise routine includes psychological motivators which are integral to her fitness and exercise routines. Note that "addicted" may be literal in meaning or it may simply reflect her high enthusiasm and motivation. In any case, apps also help with commitment. For example, although kickstarting and keeping committed were more common in fitness rather than diet routines, Dee and Richard found that their food diary apps help them maintain commitment because it provides weekly meal planners and sends pop up reminders to enter meal data.

5.7.3 Enjoying novelty

In this category, mobile devices typically provide consistency to routines. However, for certain participants, a new mobile device or a new location provided novelty. For example, even Liz, who is innately motivated to exercise, was drawn to the novelty of wearable devices. Her personal experience includes an active lifestyle which is a way of life for her. She was an elite athlete and teaches physical education. Furthermore, "health and exercise wise", her whole family is "very motivated". Liz shares her thoughts about her wearable device (Fitbit):

> *I think it's a bit of a novelty. …It's a novelty to start with and I exercise but somebody who probably doesn't, needs the motivation to do something like that. And I think it's absolutely brilliant. …I know a lot of my non-sporty mates have it and they love it.* (Liz)

"Non-sporty mates" is an interesting notion that illustrates Liz's awareness of her less sport-motivated friends who use wearable devices that are "absolutely brilliant" motivators for them. Personally, she is more motivated by vitality and the prospect of longevity which are both supported by an active lifestyle.

In comparison, Aziz feels that fitness apps have lost their appeal because:

> *if I go back to the, the variability of devices for fitness, after a month of usage, you know that there's nothing new you're getting. …It's going to do your heartbeat. It's going to do your calories. So, what!* (Aziz)

Aziz found that fitness apps provide nothing new after a month which was similar to Liz's comment that "it's a novelty to start with". Reg reflects and responds differently to his walking app saying, "maybe the novelty will wear off…I don't think so. I think it is quite interesting to say I do, you know, a regular amount of exercise". For Reg, it is interesting enough that his app confirms his efforts in steps (that he has walked). Richard also appreciates novelty of a different kind in his fitness routine and he combines novelty with consistency. He plans a different nature walk holiday each year and sets himself targets. His apps remain a constant and the holiday is the novelty.

5.7.4 Tracking and benchmarking

Participants tracked their fitness and diet routines with their mobile devices. This entailed monitoring personal metrics such as the number of steps or the number of calories burned. In comparison, benchmarking extends to comparing fitness performance with peers, but it does not include comparing *diet* data with peers because it is only fitness focused.

5.7.4.1 Entering data

As part of tracking, participants enter or log data in their apps. For example, Reg uses his smartphone notes to record his "gym exercise stuff" in a plain text file which includes details of exercises to perform such as "do a plank for two minutes". Miles logs his CrossFit WOD (Workout Of the Day). WOD refers to the workout and is also the name of the app. Richard explains that sometimes "a message will pop up" reminding him to log the details of meals in

his diary app (which he appreciates). For Richard, data entry is integrated into his daily life because he is a pilot with a lot of downtime in-between flights. He said, "I can sit there and easily enter the data on the app whiling away. The hours slip by". The convenience of his personal mobile devices supports his motivation to enter data.

5.7.4.2 Seeing progress and details

For participants, tracking was a way of seeing progress. Mobile devices record and aggregate personal data and present progress visually. Miles explains that his app stores every workout that he performs:

> *the good thing about it is I can take notes and, say if I've done weights, I can keep track of how much weight that I did. And, then I can go back …I actually graph it as well. So, it shows you, it's a very visual tool to see your progress.* (Miles)

Seeing details of routines was important to participants. To keep on top of their respective diets, both Richard and Dee found it helpful to *see* weekly meal planners on their food diary app. For Dee, it was about seeing and balancing (or re-balancing) the nutrient content of food:

> *it gives you your breakdown of carbs, fats and proteins and how your balance is so, where you may be one day, you might have too high a percentage in a certain bracket and you try to concentrate more on protein or less fat or whatever* (Dee)

Richard said that the calorie counting visuals on his food diary app made him "very aware" of the need to balance his food intake. He explains that, "I'll just take cake yada yada. I already need to make sure I have a light lunch". By "take cake yada yada" he meant that if he eats cake, he needs to consume fewer calories at lunch to offset the calories in the cake. This was Richard's way of regulating his caloric intake and eating his cake too. Both seeing and feeling progress was important to participants whether it was based on numbers or on other positive results of their routines. For example, Richard refers to both the "number" as well as the "by-product" and "tangibles" of his fitness and diet routine:

> *I had to achieve that number of weight to satisfy my medical requirements to hold my licence which was to gain employment. …That was all I was interested in but the by-product of that was that I started being a lot more*

> *active and having a lot more energy and clothes fit me better and all those sort of tangibles, that are, they're huge.* (Richard)

Feeling energetic and slimmer in his clothes is "huge", that is, impactful and rewarding. For Richard, seeing and feeling progress were intertwined and the tangibles, as well as tracking, motivate him to continue his routine.

Sometimes, participants used their tracking data to explain their *lack* of progress or activity. For example, Richard described the "disappointment" of days when his weight was not what he wanted, whereas Reg interprets data from his app to understand his walking performance. He moans and uses an expressive metaphor to describe his inactive days:

> *Oh, look at that day, wasn't I a sloth that day!... Oh, what was I doing that day? Oh, it was probably rain. OK, I actually took the car to the station first time in about, because it was raining so hard and of course you look at the app and go "Errrr, almost to zero", you go "oh, [moan] that wasn't a good day"*. (Reg)

Reg compares information (or data) from his app with his memory of past performance. He knows that he had a slack, "sloth" day because of the rainy weather. Essentially, Reg's app tracks the numbers while he provides the sense-making narrative to explain why he sees scant progress or activity on certain days. For Reg, tracking involves both seeing progress and accounting for inactivity because both are important to him. He apparently accepts that slothful, rainy days occur in his fitness routine.

5.7.4.3 Appreciating the convenience of tracking

Participants appreciate the *convenience* of mobile tracking in their routines, especially Shanna because she recalls the *inconvenience* of tracking her fitness routine before her mobile devices:

> *[You] Just went for a run and sort of calculated in your head, "yeah, it's probably about four [kilometres]". Or, if you're really desperate, you'd jump in the car and drive around the, drive around the route the best you could. …To see how far you'd run. So, but you never knew how many calories you'd burnt. …Now, we're a bit spoilt, we've got something to do all the work for us.* (Shanna)

By "work" Shanna meant that apps track and calculate her exercise. Driving a car to measure running distance was unique to her in this study and it helps explain why she used the phrase "a bit spoilt". In other words, she thinks that people today take mobile tracking functions for granted. Participants were accustomed to the convenience of tracking exercise with mobile devices. However, Reg referred to his first phone as "a dinosaur" and Shanna mentioned how *inconvenient* it was before the technology. Richard also appreciates the convenience of tracking and explains that his smartphone goes in "one of those pocket arm bandy things" while he trains which means, unlike Shanna who drove a car to track her running distance, he is hands free and car free. He states that his apps are easy to use and "the information is so readily there and, in fact, it's pushing you with information". By "pushing", he meant that his app sends reminder messages that appear on his mobile screens. The messages prompt him to enter data which he does "easily" and conveniently.

5.7.4.4 Encouraging discipline and improvement

Tracking encourages participants to be more disciplined in their routine which supports improvement. For example, Dee found her food diary app to be motivating because it encourages her "to be more disciplined" in tracking "everything". By "everything" she meant all her food intake. Reg explains how tracking motivates him to reach 10,000 steps stating, "I'll see how far I can go, and you try to improve. So, each time you go out, you try and think if I do a little bit longer maybe I can hit the 10,000". Importantly, Richard's food diary app also encourages him to improve by charting a point in the future:

> *It [the app] charts your progress very well… It'll give you a target of what your weight will be at a future point. …So rather than being disappointed today because the scales say you don't weigh what you want to weigh it'll say, if you keep doing this this way, at some future point and you nominate that future point.* (Richard)

A target is a very visual point in the future that encourages Richard to improve rather than dwell on short-term disappointments or setbacks. In short, his app encourages discipline and improvement which involves seeing past and *potential* future progress.

5.7.4.5 Comparing fitness performance

Only a few participants spoke of comparing fitness performance against peers, and Shanna and Liz were the only participants to compare their fitness performance with a family member. Shanna uses her wearable technology to compare her daily number of steps (step

count) with that of her 10-year-old son who has his own wearable technology. She explains that "the 10-year-old wears it as a watch to school" and they will compare step counts at the end of each day. Comparing was simple yet motivating because mother and son were competitive and although Shanna did not refer to it as benchmarking, it is an informal arrangement in which her son is her fitness peer. Rather than competing, Liz compares with her adult daughter as a point of reference. Liz considers her typical 10,000 walking steps per day to be above average for most people, but just "average" compared to her daughter who usually does 25,000 steps a day.

5.7.4.6 Being wary of benchmarking

Participants varied in their attitude to benchmarking and Miles was the only participant who said that he benchmarks. He does so because he needs to compare his workout standard to others in preparation for CrossFit competitions. However, he benchmarks cautiously. Miles was concerned with the trustworthiness of benchmarking. His Beyond the Whiteboard app enables him to compare his training results with people at his gym as well as people worldwide. However, he prefers limiting this comparison to people he knows stating, "I just personally look at my friends and people from my gym". He cautions that with strangers, "it could be a little bit of a dark area [and he questions] whether the data is legitimate". Miles trusts the performance data of his peers and mistrusts the performance data of strangers because the data are unverifiable. Conversely, data from his peers are trustworthy because he has seen these people working out in his gym which basically means he trusts his gym peers and his own eyes. Although he benchmarks for competitions, he is more focused on his own progress stating, "it's not so much benchmarking with other people, it's benchmarking or progress tracking for yourself".

Like Miles, Richard was more focused on tracking his own progress than comparing with others. Miles and Richard were wary of comparing. However, they cite different reasons for this. Miles mistrusts data from strangers because it is unverifiable and therefore unreliable while Richard dislikes comparing because he does not want to be on display as he reveals:

> *I wouldn't have gone to Weight Watchers because I think there was, to me there would be a stigma attached to going to Weight Watchers. I wouldn't want to be, you know, that didn't suit what I wanted to do. This is more done and it's more private I guess, more, more private but less, you're not on display in front of your peers. So, if you fail, it's only known to you.* (Richard)

Richard was not motivated by the prospect of benchmarking, that is, tracking progress against his peers. "Stigma" is a strong word which indicates his strong feelings against attending Weight Watchers, and this explains his preference for privacy and autonomy in both training and tracking. However, he *was* motivated by what he refers to as "the chipping away element" which does suit him and is discussed in the next section.

5.7.5 "Chipping away"

Richard voiced "the chipping away element" to explain his experience of making small achievable changes in fitness and diet routines over a period of time. Participants use mobile apps to support these routines. Three participants namely Richard, Reg and Miles described their experience of incremental progress. Richard reflected:

> *I think it's the chipping away element of both these devices that rather than saying I want to lose weight or wanna [want to] run half a marathon and not really have a program or a support network around you or not really wanting to go down the whole Weight Watchers or join a running group, it allowed me to do these little by little changes on my own with some sort of guidance.* (Richard)

Richard sees diet and exercise figuratively as chipping away and literally as incremental progress that includes "little changes" and "small choices over a long period of time". Chipping away is his personal way of *Going mobile for health and wellness*. Richard's approach to living well includes pursuing his routine his own way and autonomy is a motivator.

Reg describes similar observations of incremental progress in different words:

> *I walked to the station, walked home, walked from the station to the city to the office and stuff. And, it's actually just so little things that you realise that do build up.* (Reg)

Incidental walking was significant to Reg and, in comparison, Miles states that, "I like to see my progress increase a bit. …I like to see that I'm actually getting a bit fitter". To see his progress, he tracks in various ways which includes keeping detailed notes in his app about each workout and by comparing the results between repeated workouts. Miles explained that each workout has a lady's name assigned by his gym to signify its (her) identity and

importance. He used the example of comparing the "Karens" to see his progress between repeated workouts.

Richard's use of the word "religiously" indicates his devotion to his incremental progress, stating "I used them [that is, his apps] religiously about nine months last year". Similarly, in the following, he mentions "small changes" and "small choices" over the long-term:

> *it forced me, or helped me, make small changes in what I eat which hasn't impacted on my life. It hasn't meant I've been eating cardboard and buckwheat but it's just about making small choices over a long period of time.* (Richard)

Richard sees his apps as forcing and/or helping. I understood that he needs forceful help to commit to his routine which his apps provide. The use of "cardboard" and "buckwheat" in the same sentence suggests Richard's distaste for eating buckwheat as part of an extreme diet which may be literal or just an expression. Either way, he was not motivated by the prospect. What he did find motivating was progress albeit incremental.

5.7.6 Following directions

Directions are a kind of external guidance. As part of their fitness training, participants follow directions which come in various online and offline forms. Although Miles follows his smartphone for scheduling and tracking, when it comes to deciding what workout to do each day, he trusts his coaches to make decisions on his behalf because, "obviously, they're a lot more qualified". Also, because decision-making is difficult when there are hundreds of workouts to choose from, Miles states that "basically, I just turn up in the morning and do what they say I need to do".

In comparison, Dee responds to cadences and haptic buzzes from her interval training app on her smartphone which prompt her to change running pace. She explains that her app:

> *has background music and some of them have specific cadences …different cadences for slow running and sprints. And so, you'll do like, I don't know, a sixty second burst and then you'll have twenty or thirty seconds of slow walking or lower intensity and it'll prompt you through all of that through audio. …and it might buzz as well to trigger a change* (Dee)

Richard also follows audible directions from his fitness apps stating, "you pop them on your ears, and they tell you to walk and run". When following directions, he sees himself as being

herded like cattle stating that he needs "a bit of a poke and prod", "to run around the paddock". Like Miles and Dee, Richard just follows directions which seems to simplify his fitness training.

5.7.7 Using app features selectively

Participants use fitness and diet routine app features selectively. This selectivity is an integral part of *Going mobile for health and wellness* because mobile devices offer countless features and participants focus on what suits them and avoid what does not. For example, Reg states that his fitness app is "incredibly complicated" and he did not want to be "obsessive" about tracking. He explains:

> *[The app] counts your steps and how far you've walked. And so, I've been using that on a regular basis and it does it every day and it does it over the week and then you break it down into how much you walk every five minutes if you're anal.* (Reg)

This was Reg's way of saying that the app has features available for other people who are fastidious about exercise and/or mobile device features and prefer to see data broken down to miniscule details. Richard echoed a similar experience with his food diary app stating that, "There's a lot of features on this app that I don't use. …and, like any device or computer that I probably just use the bare minimum and that's what I want. I'm not unhappy about that".

5.7.8 Sharing my success selectively

Participants were reluctant to share their fitness success outside their social circle, that is, publicly. For example, Reg states that other than telling his wife he did 10,000 steps in a day, "I'd keep it fairly private". Although Miles does not train privately, he prefers to be somewhat private about his workout data stating, "I don't like posting my workouts on Facebook for everyone to see". Miles was selective about sharing and trusting data from people outside his social circle and refers to a benchmarking "dark area" that comes from strangers. Richard was also selective about *who* he shares his success with publicly. He reflects:

> *fitness is probably something… I just keep close to my chest because I'm not very fit. I don't like to admit that to myself or the world, so it's probably not something I talk to people about.* (Richard)

Richard was also aware of oversharing health and wellness successes on social media specifying that he prefers sharing "milestones" because, "sharing every event, so every time you go for a run or a walk, it's sort of, no one cares after a while and you can run a marathon and everybody's just ugh!". Apparently, oversharing can diminish the impact of milestones and he groaned emphatically.

In Category 2: *Feeling connected*, participants enjoyed trivial topics and sharing success (as well as frustration) in small supportive groups (albeit they were selective about sharing on social media). In *motivating myself*, participants rarely shared and even specified their non-use of social media unprompted in the interview. Although participants were aware that their apps have a share function for social media, sharing on social media was not typically motivating for them. Miles said that on his workout app, "there is literally just a button that says, 'share on Facebook', you just click it and it goes on my wall". He adds that he is "not a fan of doing that" because everyone on his Facebook account can see it. Miles prefers text messaging about "exercise stuff" because he finds social media too revealing. In comparison, Dee said light-heartedly that the link to social media on her fitness app is "so you can track how your friend's going and boast about how well you're doing". She does not use it because, as she states, "I don't like people knowing that level of information about me. I like to be in control over what's getting posted in social media".

5.7.9 Summary

For participants, the mobile way of motivating fitness and diet routines entails knowing personal motivators and the personalisation of routines. As a collective norm, tracking and seeing progress with mobile devices and feeling good physically and emotionally were major motivators for participants in this category.

5.8 RELATIONSHIPS BETWEEN CATEGORIES

The relationships drawn between analytic categories "provide a conceptual handle on the studied experience" (Charmaz, 2006, p. 3). This section explores and presents the relationships between the categories of *Going mobile for health and wellness*. For each mention of a category, I have used italics and a capital letter for emphasis and clarity.

Notably, Charmaz (2016) emphasises that findings explicate a social process because she has a background in sociology. There is evidence of cause and effect between the categories

Facing uncertainty and *Doing my own research*. Uncertainty about health and wellness prompts participants to do their own online research and vice versa (although less frequently) because researching can cause feelings of uncertainty from information overload and overthinking. However, this process only partly explains the connectivity because category relationships are complex.

Charmaz (2016, p. 218) suggests using diagrams to depict the relationships between categories with "concrete images". I attempted this with mixed results because I felt that my diagrams did not illustrate the relationships comprehensively. However, the attempt illustrated the difficulty of capturing the complex relationships between categories diagrammatically. Therefore, I summarise the relationships in text and in the table at the end of the chapter along with the main information types and information actions involved. The relationships are presented in a similar way to other constructivist grounded theory doctoral studies in Library and Information Science (LIS) (Davis, 2015; Mulatiningsih, 2017). Following, I use bold text to highlight the nature of relationships between categories which includes **supports**, **prompts**, **mitigates**, **hinders**, **mutual relationship** and **subtle relationship**.

The five categories of experience are related in various complex ways. One category, *Knowing myself*, **supports** all other categories because for participants, knowing mind and body is fundamental to health and wellness. *Knowing myself* includes both knowing *about* myself and knowing *for* myself, the former is about mind-body awareness while the latter emphasises knowing personally what it is to be healthy and well from lived experience. All categories involve both kinds of knowing.

In certain situations, *Knowing myself* can also **prompt** all other categories because participants are aware that they need (or want) to connect, face uncertainty, research or motivate themselves in a routine. For example, *Knowing myself* through inner sense **prompts** *Facing uncertainty* and *Doing my own research*. *Knowing myself* and *Facing uncertainty* **prompt** *Motivating myself* because uncertainty about health and wellness motivates participants to exercise with their apps. For example, Reg was motivated to walk with his app because of his high cholesterol and the risk of heart disease and taking this preventative action **mitigates** (that is, alleviates or lessens) his uncertainty about his health. *Facing uncertainty* also **prompts** *Doing my own research* because uncertainty about health and wellness **prompts** participants to search online with their mobile devices for information that provides practical and emotional support.

Some categories have a **mutual relationship**, that is, they prompt or support each other. For example, *Doing my own research* and *Feeling connected* have a **mutual relationship** when care-giving participants research for relatives. *Knowing myself* and *Motivating myself* have a **mutual relationship** because *Knowing myself* can **prompt** *Motivating myself* and vice versa. Participants need to know their personal motivators to perform their fitness and diet routines and participants learn and know their personal motivators by performing their routines.

Some categories have a **subtle relationship**, that is, they only have a slight influence on each other. For example, *Doing my own research* and *Motivating myself* have **a subtle relationship** at best because they are separate mobile app-specific categories. In other words, they typically do not interact because they are very specific actions for specific purposes. They are both context-dependent and app-dependent because *Doing my own research* mostly entails searching online via a mobile browser and *Motivating myself* is mostly fitness and diary app-based (or participants use wearable technology which is designed to track fitness). There is no evidence that participants motivate themselves with apps or wearable technology to do their own research. Several participants pursued fitness. However, no participant indicated that they did their own research to motivate their fitness or diet routine. Miles searches online for trigger point therapy charts to self-treat which may support his fitness routines, but it is a **subtle relationship** with *Motivating myself*. Dee reads fitness magazines and about new fitness apps to inspire her fitness but does not consider this to be "research".

Feeling connected and *Motivating myself* also have a **subtle relationship**. They influence each other in subtle ways because a few participants were motivated to share their fitness success with people in their inner circle or compare fitness performance with relatives. When comparing, participants combined online and offline aspects because they use their mobile device for tracking their own performance and then compare in-person with their relative's performance metrics. These participants were connected by the shared experience of tracking exercise rather than by connecting via their mobile devices (which defines *Feeling connected*). There is no other evidence that *Motivating myself* and *Feeling connected* influence each other. *Feeling connected* **supports** *Facing uncertainty* and **mitigates** feelings of uncertainty because social connections provide practical and social support when participants experience uncertainty about their health and wellness. Conversely, *Facing uncertainty* **is mitigated** by *Feeling connected.* When *Facing uncertainty*, participants demonstrated a pattern of relating to people in their inner circle for reassurance.

Finally, in rare examples, *Doing my own research* can **hinder** *Knowing myself* and *Facing uncertainty*. This occurred when participants experienced information overload as a barrier to following their instinct or intuition (inner sense). For example, Amelia faced too much information and read too much into that information. As she states, "I have so much information at my fingertips. I know how to access it. I do far too much research". She believes that she should have "stopped and listened" to herself since pregnancy and to her daughter since birth. For Amelia, both *Knowing myself* and *Facing uncertainty* involve following her instinct. She has since learned from these personal experiences (that is, information experiences and life-changing experiences) to research less and follow her instincts more.

Following, I summarise the relationships between categories in table form.

Table 6 Tabulating the relationships between the categories of experience

No.	Category	Short description	Relationships to other categories
1	Knowing myself	Knowing my mind and body for health and wellness	Knowing myself **supports** and can **prompt** all other categories.
2	Feeling connected	Feeling technically, socially and psychologically connected in supportive relationships	Feeling connected **supports** and **is supported** and **prompted by** Knowing myself. Feeling connected **supports** Facing uncertainty and **mitigates** feelings of uncertainty. Feeling connected **prompts** Doing my own research. Feeling connected and Doing my own research have **a mutual relationship** when care-giving participants research for relatives. Feeling connected **supports** Motivating myself (only in a few examples).
3	Facing uncertainty	Confronting and managing uncertainty about health and wellness	Facing uncertainty **is supported** and **prompted by** Knowing myself. Facing uncertainty **is mitigated by** Feeling connected. Facing uncertainty **prompts** Doing my own research. Facing uncertainty **prompts** Motivating myself.
4	Doing my own research	Researching online for health and wellness	Doing my own research **supports** and **is supported** and **prompted by** Knowing myself (but it can also **hinder** Knowing myself). Doing my own research **prompts** Feeling connected. Doing my own research and Feeling connected have **a mutual relationship**

			when care-giving participants research for relatives. Doing my own research **is prompted** by Facing uncertainty. Doing my own research **supports** Facing uncertainty and **mitigates** feelings of uncertainty (but it can also **hinder** Facing uncertainty). Doing my own research and Motivating myself have a **subtle relationship** because they are separate mobile app-specific categories.
5	Motivating myself	Motivating personal fitness and diet routines	Motivating myself **supports** and **is supported** and **prompted by** Knowing myself. Motivating myself **is supported by** Feeling connected (only in a few examples). Motivating myself **mitigates** Facing uncertainty. Motivating myself and Doing my own research have a **subtle relationship** because they are separate app-specific categories.

5.9 CONCLUSION

In this chapter, I presented the categories of experience. These five distinct categories of experience are the main body of my findings. I believe that these categories have covered "a wide range of empirical observations" (Charmaz, 2014, p. 337). I have also explicated the relationships that exist between these categories. In the next chapter, I present a deeper view of the theory of *Going mobile for health and wellness* to enhance our understanding of the nature of information experience.

Chapter 6: The nature of information experience in this study

6.1 INTRODUCTION

In the previous chapter, I presented the five categories of experience that comprise the substantive grounded theory of *Going mobile for health and wellness*. In this chapter, I explore this substantive theory to provide further conceptual understanding of the nature of information experience in the context of this study. First, I outline *three key features* of the phenomenon. Second, I present the *Typology of information* which details the *types* of information as experienced in this study. Third, I present the *Typology of information actions* to outline what participants *do* with information.

6.2 THREE KEY FEATURES OF *GOING MOBILE FOR HEALTH AND WELLNESS*

Participants experienced *Going mobile for health and wellness* as personal, purposeful and convenient. These three key features are interrelated and influence participants' information experience profoundly. These features are evident across all five categories.

6.2.1 Personal

For participants, *Going mobile for health and wellness* is a personal, mind-body experience involving personal choice and ways of relating to information. Participants consistently voiced their personal preferences in their interview and following personal interests is intrinsic to their experience of the phenomenon. By "interests", I refer to both their health concerns and what they enjoy or prefer personally. I also realised that participants' health and wellness concerns were informing *per se* because participants identify and focus on what they are concerned about. When acting on these concerns, participants value information that they consider to be relevant, trustworthy and what feels good or right personally. For Miles, trustworthy fitness data come from people that he knows in his gym whereas Liz trusts

information from her doctor and medical journals. As a collective norm, participants focus on and filter out information according to their needs and interests.

Participants actively choose who they interact with in their personal social group that I refer to as their "inner circle". It is more intimate and supportive than their social circle which also includes acquaintances. This trusted inner circle was self-defined by each participant and most include friends and/or family in the social unit. Participants were selective about what they shared and with whom they shared. Liz captures the personal nature of the inner circle stating "I don't want to share photos with acquaintances particularly. …it would be just the closest friends". As a norm, participants make highly personal choices about people and information when *Going mobile for health and wellness.*

6.2.2 Purposeful

Health and wellness concerns impact participants' everyday lives and *Going mobile for health and wellness* provides a means of meeting their health and wellness needs (and interests). Participants are purposeful. They use their mobile devices to connect socially for guidance and reassurance as well as for general wellbeing, to research health and wellness concerns, and to commit to fitness and diet routines. Mobile devices also help participants to organise personal information such as social contacts, social events and fitness schedules.

For participants, needs and interests blur, yet they were purposeful whether they experienced the phenomenon as a solo or social experience. They were typically solo (except for their mobile devices) when they pursued their fitness and diet routines, when they researched online for health and wellness and when they organised personal information. However, participants feel connected in their everyday lives, both technically and socially, via mobile devices because it is convenient to interact virtually with people in their inner circle. Participants were purposeful in going solo or being sociable. They were purposeful when researching a health critical topic via their mobile browser, when sharing trivia with their friends via text message, when zoning out to app playlists, when walking or when updating personal contacts in their smartphone. Dee even worked on improving her "crap memory" by listening to podcasts about mnemonic devices on her mobile devices.

6.2.3 Convenient

Participants experienced *Going mobile for health and wellness* as convenient because mobile devices provide constant access to people and information. Liz commented "it's all so instant

and information is so instant". Likewise, Amelia uses mobile apps frequently because information is "just accessible. …just bang and it's there". Reg describes the "intuitive" nature of his smartphone stating that "if ever I get it wrong, just press that button and it takes you back". In comparison, Miles observed that "we've become so reliant on it [that is, easy accessibility]".

Although accessibility and instant access to information are largely a result of constant connectivity, participants also experience convenience because their mobile devices are portable (mobile) and personal (that is, exclusive and specific to them). This convenience enables participants to be organised and informed in their everyday health and wellness. Aziz reflects on getting his first tablet computer, "I found it was more productive for me, and most importantly, I can carry a humongous amount of reading material". Participants also mentioned using their mobile devices for online shopping (Ella), when vacationing (Richard, Liz), to orient themselves geographically (Richard, Miles, Zoe), to entertain children on long-haul flights (Shanna), to look up movies (Charly), to learn French (Zoe), to keep abreast of political and economic trends that impact business (Aziz) and as a medium for medical consultation (Amelia). Mobile devices facilitate many facets of life such as these on the same convenient platform. For participants, this can cause the blurring of information, communication and entertainment.

Convenience profoundly influences participants' information experience. Note that constant connectivity was also experienced as intrusion. Several participants reported that constant connectivity contributes to emotional stress such as feelings of information overload (Ella) and that they consciously regulate their use during family time (Shanna) and at bedtime (Liz) as well as their children's use (Nikita, Reg, Amelia, Shanna).

6.3 INFORMATION AS EXPERIENCED IN THIS STUDY

For the purposes of this study, information is broadly defined as anything that is experienced as informing (Bruce, 2008), and the nature and form of information is revealed in the ways that participants experience and assign meaning to it. As Demasson (2014, p. 156) states "the only requirement of information is that it informs the person engaging with it".

In accordance with constructivist grounded theory, it was the role of the researcher and the participants to co-construct the meaning of information. Throughout this study, I aimed to be open-minded about what information is and to avoid assumptions about the nature and form

of information (that is, my own assumptions as well as those of my participants). I used the broad and imperfect term "mobile health information use" in the "Participant information and consent form" (see Appendix C). At no time did I use the phrase "information experience" in the interviews. Rather, I encouraged participants to talk about using their mobile devices for health and wellness. Like Davis (2015, p. 69), I felt that it was my role to identify information experience within their narratives, rather than lead them to speak explicitly or exclusively about information. I considered my participants to be the experts in their experience of information.

During interviews, participants often used alternative words to "information" such as "data", "notes", "messages" and "stuff". For example, Reg said that "rather than carry a big paper around, my gym exercise stuff would be in the notes page [that is, in his smartphone]". Miles explained that he keeps notes in his mobile fitness apps to see his progress. Rather than using the word "information", he mentioned a type of information that is typed in his app "notes" which shows his "progress". This progress is a visual display of information that motivates his fitness routine. The role of information in this example is to track and motivate fitness. Miles' example reinforced that making sense of participants' information experience requires contextual understanding. Typically, each example in this study required contextual understanding because participants encounter complex clusters of information types. Sometimes, contextual understanding was required because of semantic ambiguity such as the multiple meanings of "data", "notes", "messages" and "stuff".

This section explores the types of information participants engage with in using mobile devices for health and wellness as discussed in interviews. To outline *what* is experienced as information, I present the *Typology of information* with a focus on the role and importance of a range of information types according to participants. This typology is essentially a guide to (or glossary of) information types and terms. Following this, I present a second typology, the *Typology of information actions,* to outline what participants *do* with information. The *Typology of information* details the types of information encountered in this study (referring to the information types using nouns) while the *Typology of information actions* outlines the ways participants experienced the information types (referring to the information actions using verbs). Thus, in the *Typology of information* following, I provide a language to explain participants' collective information experience based on the typology approach in Davis' (2015) study.

6.3.1 Typology of information

Considerable interrelation exists between information types as well as between information types and information actions. The information types that are sourced or felt internally such as *beliefs* appear first followed by externally sourced types such as *data*. Although there is no absolute duality between internal and external types, it is a useful way to observe information types. I provide cross-referencing in the text and the information types are italicised for emphasis.

6.3.1.1 Beliefs

In this study, *beliefs* refer to the personal knowing or acceptance that something is right or true. Participants either stated or indicated their *beliefs*, and it was clear that these *beliefs* informed their approach to health and wellness. For example, Ella believes in herbal remedies and doubts modern medicine (that is, Western medicine) because her doctor could not help her with recurring sinus infections:

> *I heard from someone that, perhaps from a friend, that you get a naturopath to mix up a herbal remedy and that's what I did and that cured my sinus infection… I was like wow, I've got this amazing relief within a few days and that really made me doubt modern medicine. And, then whenever I get some kind of chesty or whatever issue I always looked from then on at herbal remedies.* (Ella)

"Amazing relief" bolstered Ella's belief in herbal remedies. In contrast, Liz believes in modern medicine. She believes in her doctor and medical journals for medical advice and she states that "*The Lancet* is a medical journal that I would research, I would probably use as my Bible I suppose". Liz explains that her father was a doctor and there was always a hard copy of the medical journal *The Lancet* in their house. These days, Liz accesses the journal from her tablet computer.

Scepticism and doubt were also apparent. For example, Liz was sceptical about the Internet as a source of self-diagnosis while Reg explained his acceptance of mobile devices as a transition from "sceptic" to "a bit of a convert", indicating that his *beliefs* changed over time. Personal *beliefs* were influenced by *personal experience* (which includes family traditions) and they guide action (see *Personal experience* in this typology). Participants also confirm or validate their *beliefs* about health and wellness concerns with other information types (see Evaluating in the *Typology of information actions*). *Beliefs* are a diverse and influential information type in this study.

6.3.1.2 Feelings (physical and emotional)

Making sense of health and wellness entails using the natural senses which requires the observation of *feelings* both physical and emotional. In this study, *feelings* are defined as either a physical or emotional response to stimulus. *Feelings (physical and emotional)* inform participants of their current state.

For participants, multi-sensory experience and *feelings (physical and emotional)* were entangled in everyday health and wellness. This includes emotional awareness and empathy which requires understanding of their own *feelings* as well as the feelings of people they care about. For example, Reg conveyed his sympathy to his sister via text messages when she cracked her vertebra. I understood that she was in physical and emotional distress because Reg stated that she felt "quite down". He interpreted her *feelings (physical and emotional)* which indicates that other people's *feelings* were also information for participants. In relation to health concerns, participants often sought information that provided emotional feelings of reassurance. Like Reg, other participants also sought to comfort people in their inner circle, by communicating care and sympathy and/or providing health and wellness information (see Communicating in the *Typology of information actions*).

In terms of physical *feelings,* Miles described "a muscle knot" as a physical *feeling* which informs him that he needs physical treatment. Shanna also responds when something does not feel right physically stating "if you get a little niggle somewhere, you self-analyse on Google". Knots and niggles are uncomfortable physical *feelings* that are internally sourced information.

Feelings are significant self-care indicators and motivators because participants want to feel good or, if not good, to feel relief from pain or discomfort (physical and emotional). "Feeling good" (physically and emotionally) is a major fitness and diet routine motivator in the context of using mobile devices for health and wellness. Reg asserts that "it's about feeling good". Although the interplay of participants' *feelings* and their health was complex, it was clear that *feelings* were informing whether physical or emotional; fleeting or enduring; perceived as good or bad; encouraging or discouraging; reassuring or concerning; strong or subtle; or mixed. Participants' experience of *feelings* as an information type aligns with the broad definition of information as anything that is experienced as informing (Bruce, 2008).

6.3.1.3 Inspirational and motivational information

Inspirational information refers to information (typically external) that encourages and evokes a positive emotional or psychological response. Amelia described how the aesthetic appeal of images via her smartphone inspired her and states that, "I think if I'm checking into Instagram every couple of days and I have pages full of inspiring and healthy images, it helps me to be healthier". It was also common for participants to follow recipes for ideas and *inspirational information*.

Participants share *inspirational information*. For example, Nikita enjoys exchanging text messages stating that, "it really brightens my day". She finds that sharing funny and inspirational images and ideas each day cheers and inspires her. I gleaned that feelings of social connection with close, like-minded people was also inspiring and made participants feel good emotionally (see *Feelings (physical and emotional*) in this typology). Sometimes *trivia* was a form of *inspirational information* (see *Trivia* in this typology).

Closely related to inspiration is motivation and *motivational information* provides incentive and stimulus to pursue health and wellness-related activities. For participants, motivation was typically related to fitness and diet routines. Several participants said that music motivated their routines. Dee also explained how she uses fitness information from magazines and new apps to activate or "kickstart" her exercise routine which indicates that the information was psychologically motivating. Seeing evidence of improved fitness in the form of visual on-screen displays (that is, viewing tracking *data*) can also be motivating. Naturally, what participants consider to be motivating (or inspiring) information was subjective (see Category 5: *Motivating myself* in Chapter 5).

6.3.1.4 Instinct and intuition (inner sense)

Instinct and *intuition* are similar internal information types that require inner sense. *Instinct* is a natural, self-preserving (and child-protecting) impulse while *intuition* is the ability to understand something through inner sense or inner knowing which can also support self-care. For participants, both *instinct* and *intuition* are internally sourced and can inform and influence the pursuit of everyday health and wellness.

Participants also mentioned using mobile devices intuitively which was often because they had prior experience of using computer technology and were familiar with features and functions. Shanna referred to her smartphone as being "technically savvy", that is, easy to

use. In comparison, Reg observed that the more he used his smartphone, the more "intuitive" *he* became.

Amelia values trusting her own *instincts* as a mother of a young child and was the only participant who used the word "instinct". She stressed the importance of listening to herself and her young child to understand their shifting health and wellness needs. In comparison, Ella used the term "intuitive sense" to describe how she knows if food is good or right for her by observing her bodily reactions after eating certain foods. Ella's description of intuition suggests that it is sub-conscious and self-protecting:

> *From my own research, before I saw my nutritionist, I had already cut out quite a few things in my diet. I was realising that I was feeling better but I also, it was an intuitive thing. I wasn't eating certain things because I knew that like not consciously, but I don't think that that's going to make me feel well but I don't think it's yeah going to be of benefit to me or it might taste nice now but later on I won't feel well* (Ella)

Ella considers observation by sense and feeling to be an intuitive part of health and wellness (see *Feelings (physical and emotional)* in this typology for more about observing feelings). Broadly speaking, seeking information, seeking social connection and following curiosity can also be construed as following natural *instinct* or *intuition*. So too, can feeling alarmed or repulsed by risky topical skincare products or wanting to feel good (physically and emotionally). *Inner sense* helps participants to make sense of whom or what to trust when *Going mobile for health and wellness*.

6.3.1.5 Personal experience

Participants refer to, that is, draw on their *personal experience* for their health and wellness. *Personal experience* includes personal biology and biography, that is, formative experience, family medical history (hereditary health), professional experience, educational experience and other past experiences. In other words, *personal experience* refers to individual experience in the past tense because it is what each person knows and remembers from their life history. *Personal experience* is a profound and inseparable part of participants' information experience.

Various perspectives include seeing *personal experience* as a pool of personal knowledge and precedents which provide a basis of comparison. Participants use their *personal experience* to make sense of health and wellness. No participant has a background in medicine, so their *personal experience* is limited in medical matters. *Personal experience* may be ever-present,

but it has its limitations. Hence, participants also refer to medical professionals and mobile-mediated information for medical advice.

Participants interpret and integrate information from internal and external sources for health and wellness. The continual integration of internal and external information was a consistent, overarching action in this study (see Integrating in the *Typology of information actions*). Internal information includes participants' *personal experience* and is sourced internally from self. *Personal experience* also includes personal demographics and exceptional experiences which are outlined next.

Personal demographics such as age and gender impacted the experience of using mobile devices for health and wellness significantly. For example, awareness of age was information *per se* that informed expectations of health status. Ella was shocked that her doctor could not recommend mainstream health treatment for her fibromyalgia when she was "only 22". The two oldest participants both used the phrase "at my age" which indicates that their advanced age informed them about their health status. In comparison to males, females in this study made other people's health concerns their concern. This was especially the case for participants who were mothers of young children. This could be considered *instinct* or an aspect of the maternal role (or both). *Beliefs* about gender roles may also play a part.

Exceptional experiences as an information type refers to personal health and wellness experiences that are outstanding or extreme to participants. These experiences, whether viewed as good, bad or simply unusual, are extremely influential and memorable. Participants were typically keen to recount their exceptional experiences to me in their interview. For example, Richard recounted his milestone of losing 13 kilograms and running five kilometres without a break stating that he "wanted to shout that out to the world" as he raised his arms triumphantly.

From a participant (and researcher) perspective, Nikita's chronic, undiagnosed pain felt extreme to her and is memorable to me because this study was not focused on illness and no other participant described such an extreme personal health experience. She was wary of medical doctors because of her exceptionally difficult experiences. Whether motivational or unnerving, exceptional experiences are informing, and they influence subsequent experiences.

6.3.1.6 Personal preferences

Personal preferences are participants' specific, individual likes and dislikes. A wide range of personal preferences inform and influence participants' everyday health and wellness (see Category 1: *Knowing myself* in Chapter 5). For example, Richard prefers using his apps rather than joining a commercial weight loss program. He trains independently to avoid the "stigma attached" to a commercial weight loss program and a public display of failure. In comparison, Nikita states that her smartphone is her preferred way of accessing health and wellness information partly because "I don't really see the GP [general medical practitioner] as somebody who is going to give me an alternative". *Personal experience* as well as *feelings (physical and/or emotional)* play a role in likes and dislikes. Participants prefer what feels good or right to them personally.

For participants, choosing to use their mobile devices for certain health and wellness purposes is based on their *personal preferences*. The title *Going mobile for health and wellness* reflects these active choices.

6.3.1.7 Data

For participants in this study, *data* refer specifically to fitness and diet information that is tracked and displayed by mobile apps. Participants can see evidence of their performance in metrics and seeing progress in *data* displays on mobile devices is motivating. Hence, data can also be *motivational information* (see Tracking in the *Typology of information actions*).

When comparing his fitness performance, Miles prefers *data* from his peers in his gym rather than strangers because "it could be a little bit of a dark area [and he questions] …whether the data is legitimate". He trusts the performance *data* of his peers and mistrusts the performance *data* of strangers. *Data* from his peers are trustworthy because he has seen these people workout in his gym which basically means that he trusts his gym peers and his own eyes. Reinforcing the visual nature of tracking *data*, Richard described how his apps provide "a real snapshot" of his weight loss progress.

6.3.1.8 Guidance

G*uidance* is a general term for a diverse range of external information that provides participants with understanding, advice or directions for specific health and wellness purposes. Richard's fitness and diet apps provide everyday "guidance". By "guidance", he was referring to the tracking function and the directions his apps provide in his fitness and diet routines (see *Data* in this typology and Tracking in the *Typology of information actions*).

Data provide both *guidance* and *motivational information*. Likewise, music provides both *guidance* and motivation in fitness and diet routines because cadences on apps encourage the rhythm of exercise. Participants described how music activated and energised them.

Guidance also enables sense-making and decision-making by providing clarity, confirmation and insight about health and wellness concerns. Typically, participants seek *guidance* from people or via their mobile devices (and *from* people via their mobile devices). For example, Nikita values opinions from online forums. She reads online forum posts on her smartphone about the endometriosis diet to learn what other women did to alleviate their symptoms. Nikita was aware that it was open discussion and that "they're just writing their own opinion", yet she values these opinions which provide practical *guidance*. Professional opinion was another valued form of *guidance* (this refers to medical professionals as well as other healthcare providers).

Visual cues guided participants when watching videos or communicating via video calls. For example, Miles follows directions by watching CrossFit self-instruction videos on YouTube. He also follows the hands-on coaching provided by his gym coaches which is highly visual and tactile *guidance*. It was also common for participants to follow online recipes for how to, hands-on *guidance*.

Participants also sought *guidance* when deciding whether a health concern was major or minor and also for making sense of medical test results (see Researching in the *Typology of information actions*). Additionally, or alternatively, participants sought the advice of family and friends. For example, Charly discusses netball injuries with her friends via instant message. She asked questions such as what "other people have done in the past" and "should I go to the doctor's, should I go to the physio?" (see Communicating in the *Typology of information actions*).

6.3.1.9 Trivia

In this study, *trivia* is light, mobile-mediated information which is a mix of information and entertainment (infotainment). The medium of the mobile device is conducive to the sharing of trivia. Typically, *trivia* has no health and wellness content, rather it is amusing and socially connecting, both of which support a sense of wellbeing (or positive, *emotional feelings*). Sometimes *trivia* is a form of *inspirational information* (see *Inspirational and Motivational information* in this typology).

Interestingly, participants valued *trivia* even if they sometimes referred to it disparagingly because *trivia* is trifling to anyone else out of context. For example, Reg refers to sharing emojis and photographs of "stupid things" with his wife via text message because he knows she appreciates it. In comparison, Zoe keeps the "good" selfies that her primary school-aged sister leaves on her smartphone because she finds them amusing and considers them something of value. Shared meaning and purpose are the qualities that give information its value. *Trivia* is an information type with social currency that is valued in certain contexts (see Communicating in the *Typology of information actions*). By "currency", I mean that this information was immediate, was of value, and was exchanged between participants.

6.3.1.10 Summary

In this section, I presented the *Typology of information* which is an interpretation of the main types of information encountered in this study. Participants interact with a diverse range of information types that were neither simple to define nor delineate. For example, it was difficult to delineate *beliefs*, personal opinions and *personal preferences* because they were interrelated (and experienced individually and internally). I was aware that "opinion" is a synonym for "advice" and "judgement", all of which were valued in certain examples (see *Guidance* in this typology and Evaluating in the *Typology of information actions*).

The typologies represent my interpretation of the main information types and information actions as experienced by participants. Although I consider participants' language in interviews as information (and research data), I did not include it as an information type. Rather, I consider this language to be a means of explaining their information experience. Writing the typologies was challenging and required substantial discussion with my supervisors. However, it was clear that *Going mobile for health and wellness* was a personal, physical and emotional experience. In the next section, I present the *Typology of information actions* which outlines my interpretation of what participants *do* with this information.

6.4 WHAT DO PARTICIPANTS DO WITH INFORMATION?

In the previous section, I presented the *Typology of information* which outlined the *types* of information participants encounter, that is, *what* participants experience as informing. In this section, I present the *Typology of information actions* which outlines what participants *do* with information.

In the data analysis section of the Research Methodology chapter, I outlined Saldaña's (2009, p. 23) coding ideal of capturing the essence of each code in a short name. Since most of my initial codes were action codes, participants' actions that involved information were ideally captured in a short name. This approach encouraged me to see each information action as an information experience. However, I chose to distinguish between these individual experiences and the overall information experience. Davis (2015, p. 140) and Harlan (2012, p. 1) refer to these individual experiences as "experiences of information". I call them "information actions" in contrast to participants' collective, overall information experience. I consider participants' collective, overall information experience to be a conceptual view or collage of all the information types, information actions and categories of experience seen together as a whole. In other words, I see information experience at the granular level of each information action (or cluster of actions) as well as the collective, overall information experience.

I realised during initial coding that information actions were often complex and entailed many contextual variables. For example, "reading" was problematic because it is a complex, cognitive action that involves internalising information and because it was integral to other information actions such as researching, browsing and text-based communication. Although information actions were difficult to delineate because they were often concurrent and clustered together, there was some consistency to participants' collective experience.

6.4.1 Typology of information actions

The *Typology of information actions* represents my interpretation of the main information actions as experienced by participants. Below, I outline the information actions starting with the overarching action of *integrating internal and external information* along with cross-referencing in the text.

6.4.1.1 Integrating internal and external information

Participants engage with a range of different types of information, both internal and external, when *Going mobile for health and wellness*. They interpret and integrate information from internal and external sources for health and wellness. For example, Ella combines her knowledge of biology and biochemistry with information from her smartphone to make sense of nutritional advice from people in various media. The continual integration of internal and external information was a consistent, overarching action in this study.

Internal information is sourced internally from self and includes participants' personal experience and feelings (see Personal experience and Feelings (physical and emotional) in the *Typology of information*). Internal information is specific to one person and mostly amorphous (apart from some visible signs of symptoms or emotional feelings) which means that it essentially has no form. Participants encounter information about health and wellness concerns both from internal information types and from external information types via mobile devices as well as the advice from health care providers and offline media. Although personal experience may be limited in some cases, the continual integration of internal and external information was a major way of making sense of their life worlds. Participants integrate information from their personal experience and their mobile devices for health and wellness which was essential to *evaluating* information in this study (see *Evaluating* next in this typology). I chose to list *evaluatin*g separately because I see *integrating* as a more abstract, overarching action that focuses on the intersection or combination of internal and external information. Another way of explaining this is that synonyms for integrating are combining and merging whereas evaluating is synonymous with assessing or judging.

6.4.1.2 Evaluating

For participants, *evaluating* information for health and wellness meant determining its merit, meaning, purpose and trustworthiness for them personally. As a collective norm, participants focus on and filter out information according to their needs and interests which requires evaluation. This evaluation involves engaging with information for sense-making and decision-making which involves integrating internal and external information (see *Integrating internal and external information* listed previously in this typology).

Participants decide what makes sense to them personally by both thinking and feeling. Amelia states that she is "sensible" about taking people's advice about health matters. Charly told me that she knew if her finger injury was going to heal or require treatment by "kind of judging by how painful" it was (see Feelings (physical and emotional) in the *Typology of information*). In comparison, Dee refers to using "viable" sources and "using your own judgement" and "your own common sense" when searching online via her mobile devices. Notably, Nikita looks at the end of online articles for:

> *the person's credentials, who they are, who they work for, that type of thing, to kind of see like if this is somebody who really doesn't have some kind of health background… I will look at it in that sense to see if there is value and merit behind the article when I'm reading it. I won't just go blindly into believing what I've read.* (Nikita)

This indicates that reading and noting credentials were ways of *evaluating* the trustworthiness of health information providers.

Judgement, pain, viability, common sense, value and merit are all subjective concepts that rely on personal experience, perceptions, personal preferences and, for some, instinct or intuition (inner sense). When participants had a health concern, the imperative (or, perhaps, instinct) to make sense of and manage their situation was pronounced. Typically, they trust internal information such as emotional feelings and evaluate external information such as the online articles that Nikita reads via her mobile devices. Participants also evaluate the trustworthiness of professional medical opinions.

Observing cause and effect was a common way of *evaluating* information for health and wellness. For example, participants observe how they react to certain foods or the consequences of not exercising enough. Participants also compare to other people in their trusted inner circle to self-evaluate. For example, Liz considers walking 10,000 steps a day to be above average for most people, but just "average" or ordinary compared to her adult daughter who walks 25,000 steps a day.

Communicating with friends and family via mobile devices was another way of *evaluating* information because participants talk through health and wellness concerns. For example, Ella discusses her concerns about dietary supplements with her friend via e-mail.

6.4.1.3 Communicating

In this study, *communicating* is a broad term defined as two or more people interacting by exchanging information via mobile device or face-to-face. Collectively, participants value and derive benefits from mobile-mediated communication with people they trust and already know in-person (which I refer to as their inner circle). For health and wellness, participants experience one-to-one communication or small group communication within their inner circle as the norm. Occasionally, participants expanded their communication into broader social networks that included acquaintances in their online social circle, but they rarely interacted with strangers online. They did not mention face-to-face interactions in detail because it was not the focus of the study.

Medical consultation via smartphone was a way of experiencing information for health and wellness that was unique to Amelia in this study. She sees her doctor virtually in one-to-one audio-visual communication. Amelia states that her new doctor consults via Skype after an initial face-to-face consultation. Although she did not choose him because of this, she makes

"the most of what is available" describing it as a "unique" service that is provided via her smartphone as a convenience for patients.

Most communication for health and wellness revolved around "talking" which, in this study, denotes conversation via text message, instant message, and (less frequently) via e-mail. This is a redefinition of talking which is fundamentally different to the traditional meaning that entails using the voice to speak aloud. For example, Charly, who instant messages via her smartphone, commented that "you know, you can talk about everyday events…or life events". Liz provides an example of what she writes to her mother via e-mail which is in a written yet informal conversation style. "Oh, it's hot! I just played golf you know. …We're fine, how are you?". Sometimes talking was audio-visual communication which was also informal. Although participants mentioned using video chat which did entail using the voice, they rarely used traditional (audio-only) telephone calls for health and wellness because they preferred other channels.

Talking via text message or instant message was different to face-to-face conversation because participants use the written word (or, more specifically, the typed word) rather than the spoken word. The way participants used text messaging, instant messaging and e-mail was a blurring of writing, talking and reading (but not listening) as well as real-time and non-real-time communication. Real-time text messaging and instant messaging is essentially a kind of "type-talking" because participants type conversation rather than voice it. Talking often included trivia as an information type (see Trivia in the *Typology of informatio*n).

Talking includes small talk, weather talk and girl talk. Small talk was informal, mobile-mediated conversation that includes topics of little importance to anyone except the people involved in the conversation. Small talk in this study includes weather talk and girl talk. Participants experience weather talk as informal mobile-mediated conversation about the weather and Reg states that talking about the "weather in Moscow" that is available from his mobile device was a way of starting conversations with his taciturn mother-in-law. He describes this as a way and "a medium for communication with somebody who's not always that communicative".

Female participants experienced what is colloquially known as "girl talk" which is female-only conversation such as talking about menstrual periods (Nikita) or cervical cancer (Charly). However, the talk was not necessarily confined to female health concerns, it simply

involves females talking and sharing with other females about health and wellness via mobile devices.

In addition to (or in tandem with) talking, participants also shared information via their mobile devices in a diverse range of formats such as emojis, photographs (including selfies), quotes, links to health-related articles and e-mailed medical test results.

6.4.1.4 Researching

In this study, *researching* includes seeking, reading and *evaluating* information for health and wellness (see *Evaluating* in this typology). Most *researching* was online via mobile browsers (or, less frequently, apps) and it was common for participants to specifically mention using the Google search engine. Although participants also referred to offline information such as health pamphlets, magazines, books and television, they did not consider this to be *researching*. In one exception, Ella considered reading books on nutrition and listening to specific radio programs as *researching*.

Category 3: *Doing my own research* explains a major information experience in this study. For participants in this study, "researching" refers to online information searching which is outlined in the *doing my own research* category description. Broadly speaking, participants research for two main purposes that were often interrelated. For health and wellness, participants research for information that provides guidance and/or feelings of reassurance (see Feelings and Guidance in the *Typology of information*). For example, Nikita researched online via her smartphone "to feel a bit more comfortable" before undergoing surgery. *Researching* provides both guidance (insight) and reassurance, that is, reassuring guidance. Caregivers in this study researched their relatives' health and wellness concerns on their behalf.

6.4.1.5 Browsing

Participants follow their health and wellness interests when *browsing* online via their mobile devices. *Browsing* also includes the browsing of media such as books and magazines. This was mentioned infrequently, however. By "interests" I refer to both their health concerns and what they find practical, amusing, engaging, inspiring or newsworthy. Following interests may involve information with a combination of these qualities.

Browsing typically included light and enjoyable subject matter in comparison to health critical topics in Category 4: *Doing my own research* and may include infotainment, that is, an information-entertainment mix (see Trivia in the *Typology of information*). However, there

was no clear distinction between "researching" and following curiosity and interests other than how participants defined them. The medium of the mobile device is conducive to the blurring of information and entertainment. Looking for recipes online may be *researching* or *browsing* depending on the purpose. For example, Nikita and Ella research diet-specific recipes while Zoe browses for new recipes for variety because she gets bored with breakfasts. Relieving boredom can also be considered a way of attending to personal wellbeing. Online recipes were a common source for ideas and inspiration (see inspirational and motivational information in the *Typology of information*).

I understood that *browsing* by following interests was purposeful in a different way to *researching* with the priority being amusement rather than addressing a health and wellness concern. For example, Dee mentioned "playing on the iPad and browsing". She also specified that she looks for "interesting" rather than "serious" fitness podcasts which indicates that amusement was important to her. Similarly, Amelia sought "interesting information" when browsing online because she is naturally drawn to topics of interest whether for health and wellness or otherwise. She browsed for information on the Paleo diet out of interest even though she was not actually on the diet. *Browsing* involves entertainment, exploration and serendipity, so topics of interest were not limited to health and wellness concerns. In contrast, Reg "checks Safari" (a web browser) and used the word "scan" when *browsing* for interesting online news. He was also following his interests in the sense that he was *browsing* global news to "feel connected" to the world and *browsing* the weather in Singapore because he was flying there soon.

6.4.1.6 Organising

For health and wellness, participants experience *organising* personal information with their mobile device as supporting and reassuring. Mobile devices enable participants to store and organise their work and social contacts, calendar events, personal health information, fitness schedules, the results of their online searching in app notes (Amelia) as well as open browser pages and screen captures (Ella). In addition, Ella explains how she organises articles and recipes that suit the grain free diet she is on:

> *I've got a lot of pages that I've liked on Facebook and the people on those post articles and stories and links that I then view on my phone. I save a lot of articles and recipes on my phone as little icons, so I just click onto them straight away.* (Ella)

Organising also includes keeping personal health records in apps. It was important to Amelia to write and keep records of her daughter's personal health such as her hip dysplasia and developmental milestones. She thought it was important because her young daughter took up "about 99 per cent" of her attention and memory which she called her "headspace". Amelia added that "I don't know if there's room for much else".

A few participants stated that they function better with their mobile phone and feel lost without its ability to organise personal data and information:

> *Seriously, if I did not have my smartphone, I'd be in a terrible position. I don't know how I'd function… Not just for the health and fitness type stuff but everything else depends on my phone.* (Miles)

Similarly, Aziz explains that "the moment I'm without my phone, I'm gone, because I don't know anybody". He meant that he cannot function in everyday life without his contacts app because he cannot remember all the contact details. His mobile devices provide a supportive, safekeeping function where his memory falls short. Hence, they also provide feelings of reassurance in everyday life.

6.4.1.7 Tracking

Participants refer to "tracking" their fitness and diet routine with their mobile devices which includes monitoring personal metrics such as the number of steps or the number of calories burned. *Tracking* is important to participants who use mobile apps or wearable technology because the *tracking* function both informs and motivates them. By tracking, Miles knows his location and how far he has run using the GPS (Global Positioning System). *Tracking* calories (calorie counting) promotes awareness of how much energy is in food in order "to make better choices" (Richard) while *tracking* meals encourages a "more disciplined" approach to dieting (Dee). For Reg, sometimes *tracking* was simply using his smartphone stopwatch to time how many minutes he can hold plank position.

Participants trust their mobile apps and wearable technology to calculate and display data (see Data in the *Typology of information*). *Tracking* is a specific way of *organising* and *evaluating* fitness and diet data that involves both mobile device data *and* personal sense-making. Seeing and feeling progress is important to participants whether it was based on numbers from apps or on other positive results of their routines. For example, Richard refers to both the "number" as well as the "by-product" and "tangibles" of his fitness and diet routine. The by-product of his routines is feeling energetic and slimmer in his clothes. Feeling

this progress is a rewarding way of evaluating the success of his routines (see Feelings (physical and emotional) in the *Typology of information* as well as *Evaluating* in this typology).

6.4.1.8 Summary

The typologies are a conceptual distillation of everything participants experienced as informing in the context of the study. Of the seven main types of information actions, *integrating internal and external information*, *evaluating* and *communicating* were the most prevalent across the categories. All participants were integrators, communicators and evaluators. *Integrating* and *evaluating* were essential to *Going mobile for health and wellness* and were associated with all other information actions. The remaining actions of *researching*, *browsing*, *organising* and *tracking* were also important to participants who experienced them as part of their everyday health and wellness.

The *Typology of information* detailed the types of information encountered in this study while the *Typology of information actions* outlined information actions. Each information type and information action contributed to the overall information experience of *Going mobile for health and wellness*. The typologies provide a vocabulary to explain information experience in this study. Table 7 following lists the main information types and information actions that occur in each category.

Table 7 Summary of information types and actions in each category

Category of experience	Information types	Information actions
Category 1: *Knowing myself* The phenomenon is experienced as mind-body awareness which is basic to self-care and this is supported by mobile-mediated information. *Knowing myself* includes knowing *about* myself and knowing *for* myself and supports all other categories of experience.	• Beliefs • Feelings (both physical and emotional) • Instinct and intuition (inner sense) • Personal experience • Personal preferences • Guidance • Trivia • Inspirational and motivational information	• Integrating internal and external information • Evaluating (which includes observing cause and effect) • Researching • Browsing • Communicating
Category 2: *Feeling connected* The phenomenon is experienced as feeling socially connected with the support of mobile technology. Social connection is basic to each participant's sense of wellbeing and includes staying in touch and sharing everyday life moments with family and friends.	• Trivia • Inspirational information • Guidance • Feelings (physical and emotional) • Personal experience • Personal preferences	• Integrating internal and external information • Communicating
Category 3: *Facing uncertainty* The phenomenon is experienced as engaging with mobile-mediated information to confront and manage risk and uncertainty about health and wellness both strategically and emotionally. Participants often have a heightened awareness about their health associated with a sense of urgency to act and this action involves their mobile device.	• Guidance • Inspirational and motivational information • Instinct and intuition (inner sense) • Feelings (physical and emotional) • Personal experience • Personal preferences	• Integrating internal and external information • Researching • Evaluating • Communicating

Category 4: *Doing my own research* The phenomenon is experienced as integrating information from the Internet via mobile devices with personal experience for specific health and wellness concerns. Research typically requires obtaining trustworthy online information and is done alternatively or additionally to the advice of medical doctors.	• Guidance • Feelings (physical and emotional) • Personal experience • Personal preferences	• Integrating internal and external information • Researching • Evaluating For some participants, *doing my own research* also involves: • Communicating with relatives
Category 5: *Motivating myself* The phenomenon is experienced as motivating personal fitness and diet routines by *knowing myself*, feeling good and using mobile devices.	• Data • Guidance • Motivational information • Feelings (physical and emotional) • Personal experience (including patterns) • Personal preferences	• Integrating internal and external information • Tracking • Evaluating • Organising

6.5 CONCLUSION

In this chapter, I outlined the *three key features* of *Going mobile for health and wellness*, that is, participants experience it as personal, purposeful and convenient. I also presented the *Typology of information* which details the *types* of information encountered in this study as well as the *Typology of information actions* to outline what participants *do* with information.

I have presented this study's findings in two chapters. In Chapter 5, I explained the five categories of the theory of *Going mobile for health and wellness*. In this chapter, I explored the substantive theory to provide further conceptual understanding of the nature of information experience in this study. Together, the findings chapters provide a rich and holistic understanding of information experience in this study. Next, in the final chapter, I discuss the significance of these findings.

Chapter 7: Discussion and conclusion

7.1 INTRODUCTION

In the previous two chapters, I presented the findings of this study in considerable detail. In this final chapter, I discuss the significance of these research findings. The primary contribution of this study is the grounded theory of *Going Mobile for health and wellness*. In this chapter, I compare my theory to existing theory and research.

First, I provide a research overview that outlines the study's main findings. Second, I discuss my return to the literature. Third, I discuss how each of the five categories relates to the literature. Fourth, I discuss ten facets identified from the categories in relation to existing literature. Fifth, I outline the contribution of this study to existing knowledge and practice as well as the implications for information experience. Sixth, I state the study's limitations. Finally, I provide suggestions for future research as well as the conclusion to this study.

7.2 RESEARCH OVERVIEW

The resulting substantive grounded theory from this study titled *Going mobile for health and wellness* addressed the research question:

> What is the nature of people's information experience in using mobile devices for health and wellness?

Emanating from this question, the purpose of the study was to develop a theory that is relevant and relatable to people in everyday life. I did so by viewing the phenomenon with an information experience lens and using a constructivist grounded theory approach.

The theory of *Going mobile for health and wellness* includes five categories of experience which are the main body of my findings. The interconnected categories of experience are: *Knowing myself; Feeling connected; Facing uncertainty; Doing my own research; and Motivating myself.* These categories represent a conceptual view of participants' collective experience of the phenomenon.

From the categories, I developed two typologies which detail the *types* of information encountered in this study as well as what participants *do* with information. In so doing, I identified what participants experienced as informing in a previously unexplored context.

Participants experience *Going mobile for health and wellness* as personal, purposeful and convenient. These three key features are interrelated and influence participants' information experience profoundly. These features are evident across all five categories. *Going mobile for health and wellness* is relevant and relatable to people in everyday life because it is grounded in the experiences of people in everyday life.

Going mobile for health and wellness is an interplay or fusion of three major elements in one phenomenon. The three elements are *the mobile element*, *the health element* and *the information element*. These three elements are interdependent and interrelated when viewing the phenomenon.

In addressing the research question in the two findings chapters, I have contributed knowledge to the information experience domain which has no theory or research in the context of mobile devices or health and wellness. In this chapter, I demonstrate my contribution further by comparing my theory to related research.

7.3 RETURNING TO THE LITERATURE

Prior to my confirmation of candidature seminar in late 2014, I completed a preliminary literature review. The purpose of the review was to define the scope of the study and map research territories and their relationships. In so doing, I revealed the gaps in the literature and positioned my study.

Both the role and the timing of the literature review in grounded theory are contentious. The founders of grounded theory, Glaser and Strauss (1967) argue against a literature review before theory is developed. Charmaz (2006, p. 165) agrees that delaying the review "encourages you to articulate your ideas" rather than the views of prior studies. Glaser (1998, p. 68) argues that exposure to existing theory may leave the researcher "awed out" by the impressive work of others. In this study, it was a requirement of the doctoral program to provide a literature review early in the study, that is, before theory development. Therefore, I acknowledge that while the premise of a delayed literature review is valid, it was not practical in this situation. As a compromise, or balanced approach, I avoided the literature from late 2014 (that is, post-confirmation of candidature seminar) until the development of my theory

in late 2018. Essentially, I avoided being influenced and "awed out" by related theories until I had developed my own theory.

In demonstrating my contribution to existing knowledge, I compare my grounded theory to the literature published both before and after my preliminary literature review. Once theory is developed, it can be examined with existing theories in the literature to ascertain "how compatible or different" the new theory is with the literature body (Mansourian, 2006, p. 388). Charmaz (2014, p. 165) considers engagement with the literature to be a continuation of constant comparison. Thus, I examine and compare the theory of *Going mobile for health and wellness* with evidence in the literature starting with information experience studies and then widen my scope to the wider Library and Information Science (hereafter LIS) discipline.

When I started my research, few empirical studies on information experience existed. At the time of writing, this remains the case. Several studies on information experience in the context of social media exist (Bunce, Partridge, & Davis, 2012; Yates & Partridge, 2015; Davis, 2015; Miller, Davis, & Partridge, 2019) as well as "information as-it-is-experienced" by music composition students and dancers (Lupton, 2014), the online information experiences of people experiencing socioeconomic disadvantage (Smeaton, Bruce, Hughes, & Davis, 2017), the information experience of immigrants (Beretta, Sayyad Abdi, & Bruce, 2018), and the information experiences of parents involved in negotiating post-separation parenting arrangements (Partridge, McAllister, Toohey, Field, Crowe, & Allcock, 2018). Other LIS studies mention information experience (Harlan, 2012; Lloyd, 2014; Narayan, 2014; Gorichanaz, 2015; Talip, 2016) while several studies focus on the experience of their participants in a professional context (Olsson, 2016; Talip, 2016; Gillespie, Miller, Partridge, Bruce, & Howlett, 2017; Mulatiningsih, 2017).

To date, Davis' (2015) research on the information experience of new mothers is the only existing doctoral study in the domain that identifies information experience as the object of study. She states that her study did not fit with current, dominant discourses such as information use, information seeking, and information sharing. Rather, Davis' (2015, p. 277) study was suited to the information experience domain and she considers information experience to be a broad "umbrella" term or a "meta-object" of study. Likewise, Beretta et al. (2018, p. 375) state that their paper adopts the term information experience as an "umbrella" term to cover all aspects of their participants' engagement with information.

In accordance, I consider information experience to be a broad term to describe my participants' engagement with information in the context of using mobile devices for health and wellness. In Chapter 2: Preliminary literature review, I referred to information experience as an inclusive research object. Hence, I also include studies with other information-related objects of study such as information use, information behaviour and information practice that are relevant to my findings.

Due to the lack of literature in LIS on mobile device use for health and wellness, I widened my scope to review literature in consumer health information and mobile use research. Essentially, I returned to the same broad research areas identified in my preliminary literature review. Recent years have seen an influx of studies on wearable technology as well as fitness and diet apps. Likewise, a perusal of literature on using tablet computers for health revealed that this is a topic of high interest. However, most of these studies were related to health interventions rather than health and wellness in everyday life.

7.4 HOW DOES THIS STUDY CONTRIBUTE TO KNOWLEDGE?

The theory of *Going mobile for health and wellness* contributes new grounded theory to the research domain of information experience. It provides unique insights into the meaning of information and how it is enacted and experienced in everyday life. In this section, I detail the contribution this theory makes to existing knowledge and compare my theory to existing research.

Going mobile for health and wellness is a substantive grounded theory that is unique and specific to the context and cohort of participants. Although I consider findings to be only partially applicable to other contexts, they relate to and resonate with some of the findings in existing information experience and wider LIS research as well as other disciplines in various ways. I discuss these relationships starting with the categories of experience including aspects of these categories. For emphasis and clarity, I have used italics and a capital letter for categories. In section 7.4.2, I discuss ten facets identified from the categories in relation to existing literature. These facets interrelate with the categories and include the overarching information action (that is, integrating internal and external information) as well as the nine main information types experienced by participants in this study. Given the newness of information experience as both a construct and a research domain, I had to be selective in

presenting findings that contribute to our understanding of information and information experience. Hence, my rationale was to present ten interesting and significant facets that were not necessarily discussed in the focus on categories in section 7.4.1.

7.4.1 A focus on categories of experience

Category 1: *Knowing myself* supports all other categories in my study. Although other LIS studies resonate with various aspects of this category, these studies did not distinguish between knowing *about* myself and knowing *for* myself. The former is about mind-body awareness while the latter emphasises knowing what it is to be healthy and well personally, from lived experience. Information experience was influenced by many variables associated with personal biology and biography which were not so stark in other study contexts.

Although the mobile element was absent, Yates' (2013, p. 170) health information literacy study was the most similar to mine in this respect. She found that her participants' awareness of self was critical to providing contextual understanding about their health. Yates, Partridge, and Bruce (2009) identify the category *Health information literacy is experienced as knowing myself* but this was about reading and responding to bodily cues in particular.

My category *Knowing myself* shares similarities with the study of Gillespie et al. (2017) which found that library and information professionals experience *Observations as evidence*. For my participants, "Observing cause and effect" was an aspect of *Knowing myself* that was crucial to health and wellness. Some participants valued academic and evidence-based medical information for health concerns. However, decision making was also largely based on beliefs and personal preferences.

The aspect "Following my online interests" in *Knowing myself* was reminiscent of Mulatiningsih's (2017) category *Indulging personal interests*. I observed an overlap between researching for health critical concerns and browsing for leisure topics online. Similarly, she states "the social platforms that participants used for fulfilling their personal needs sometimes intersected with the platforms that they used for professional purposes" (p. 163). For my participants, both searching and browsing were purposeful rather than indulgent.

"Knowing my inner circle" was an important aspect of *Knowing myself*. In her study, Davis (2015) mentions "levels of friendship" (p. 119), "real friendships" (p. 246), "genuine friendship" (p. 162) and "proper relationships" (p. 196). When *Going mobile for health and wellness*, participants discerned "closest friends" (Liz) from acquaintances, preferring to

connect with established contacts rather than "some random person on the other side of the world" (Miles). Participants spoke of "good connections" (Amelia), sharing selectively and caring for elderly relatives by socially connecting with them regularly.

In both our studies, participants were what Mulatiningsih (2017, p. 145) refers to as "being authentic". My participants felt comfortable being themselves when connecting with people in their inner circle.

For my participants, "Knowing my beliefs" involved validating beliefs which is like Davis' (2015, p. 234) aspect "Needing validation" in her category *Exercising self-consciousness and social awareness*. Davis' (2015, p. 137) participants sought validation that they were "doing a good job" of mothering while my participants sought to confirm and validate their personal beliefs (and suspicions) about health and wellness products, treatments and nutrition.

Category 2: *Feeling connected* shares many small similarities with other recent information research studies (five of which are in the context of social media). It seems that the similarities exist because both mobile technology and social media provide a platform for convenient, informal communications. In fact, my participants experienced a convergence of both technologies. However, the nature of communication was different because social media is a public platform while my participants mostly communicated privately one-to-one or in small groups for health and wellness.

Talip (2016) found that her participants engaged in a lot of small talk with their followers in her study on IT professionals' use of microblogging. She referred to small talk as "phatic expressions" and states that the main purpose of this talk was "social communication rather than communicating information" (p. 151). In my study, I identified, small talk, weather talk and girl talk. For my participants in an everyday context, no clear line existed between small talk for social reasons and for informational content. They valued both in their mobile-mediated conversations. I understood that Talip's (2016) definition of small talk in the context of microblogging referred to written or typed conversations. Similarly, my participants often referred to text messaging and instant messaging as "talking".

"Girl talk" in my study was reminiscent of experiences in Davis' (2015, p. 155) category *Belonging to the sisterhood* which involved belonging to a community of mothers and discussing "women's business". My aspect "Discussing health concerns with other females ("girl talk")" describes how females talk about personal concerns via mobile devices with female friends. Both involve feeling connected to other females.

The use of humour for social connection as well as the cathartic expression of frustrations was present in other studies. Davis (2015, p. 142) explains that some of her participants deliberately used humour to deal with difficult topics in social media posts while some gave advice "couched in humour, to avoid the appearance of judging". Participants in my study felt connected by sharing humour in diverse forms such as funny pictures and laughing about autocorrect mishaps. Davis (2015, p. 213) explains that mothers in her study experienced "catharsis by purging and moving on" (by posting). In her category *Sharing*, Mulatiningsih (2017) also found that her participants (LIS professionals) expressed their feelings and ranted (by blogging). Purging and ranting are synonymous with venting. My participants described cathartic venting to their friends and family (via text messages).

Several aspects of *Feeling connected* echoed Mulatiningsih's (2017) category *Being connected* as well as her *Sharing* category. The aspect "Strengthening existing relationships" in Mulatiningsih's (2017) category *Being connected* resembled my participants' experience. In contrast, Mulatiningsih's participants aimed to strengthen professional networks.

In a different context and cohort, Yates and Partridge's (2015, p. 8) theme *Wellbeing* describes a facet of participants' information experience during natural disasters in Queensland. Participants communicated their personal wellbeing via social media and also monitored the wellbeing of others.

Constant connectivity was an important aspect of *Feeling connected* when *Going mobile for health and wellness*. Yates and Partridge's (2015) category *Connected* depicted an information experience theme in social media during a natural disaster. "The sense of connectedness" was engendered through sharing, exchange and communication of information between citizens on social media in a "continual flow of content" (p. 7).

Similar to the term constant connectivity, Walsh (2012) describes the "always on" nature of mobile technology. In the area of information systems, Choi (2016, p. 325) refers to the "ubiquitous connectivity" of smartphone-based social networking services which entails seamless and constant connection to family, friends and acquaintances. She states that ubiquitous connectivity "promotes people to perceive the sense of being together psychologically" as well as a privacy concern on the negative side (p. 332). I also found that mobile devices enable a social and psychological awareness because participants *feel* constant connection (or the potential to be connected) to information and people at any time.

In terms of privacy, I found that participants were mostly concerned about privacy on social media and either refrained from or minimised their posting.

Smeaton et al. (2017) studied the online information experience of people experiencing socioeconomic disadvantage. One participant said, "my phone is my life", reinforcing the importance of connection to people and information for social inclusion. Although my participants did not identify as socioeconomically disadvantaged, they valued the social connection that constant connectivity affords which also impacted the next category *Facing uncertainty*.

Category 3: *Facing uncertainty* aligns with a few research findings in information experience and LIS. The following two information experience studies focused on using social media to feel safe and reassured during a natural disaster which presented extreme uncertainty.

Yates and Partridge's (2015) category *Coping* was conceptually similar to my category *Facing uncertainty* because people used information for practical reasons as well as to feel reassured during difficult or disastrous times. Yates and Partridge (2015, p. 9) state that during the natural disaster "information communicated through social media helped to engender feelings of comfort or reassurance".

Bunce, Partridge, and Davis (2012) studied the information experience of using social media during the 2011 Queensland floods. Their category *Affirmation* (also described as "assurance") is similar in concept to my aspect "Relieving uneasy feelings". Participants felt assured that their friends and family were safe and locatable because of communications via social media. In a conceptual parallel with my study, *Feeling connected* with friends and family relieved uneasy feelings when *Facing uncertainty*.

In comparison, Lloyd (2014) studied how resettling refugees experience a new health environment and develop health literacy practice. Her participants faced extreme uncertainty because of their displacement. While my participants confronted uncertainties about health and wellness, Lloyd describes how refugees built "information resilience" through collaborative coping activities such as *Pooling information*. This was a coping strategy which included meeting in a group to share "pieces of information" (p. 60).

In an information literacy study, Yates' (2013) category *Weighing up information* captures the experience of evaluating information when making choices about health and wellness. *Weighing up information* includes considering statistical risks and side effects associated with

surgery. My participants used information from their mobile devices to evaluate personal risk and manage uncertainty about surgery both strategically and emotionally. Yates' (2013) category *Discerning valid information* also shares similarities with the information action "evaluating" in my study. Like Yates' (2013, p. 114) participants who were members of the "Baby Boomer" generation, my participants valued "authoritative" information over "rubbish" information when *Facing uncertainty*. However, when *Feeling connected*, they appreciated "absolute rubbish" (Liz) and "stupid things" (Reg), that is, trivia because of its social and sentimental value.

When *Facing uncertainty*, Amelia (Participant 9), who had a toddler, wrote and kept personal health records on her smartphone as well as in a hard copy baby book. This echoed what Davis (2015, p. 250) refers to as "the drive to document" or using social media as a modern equivalent of a baby book. While Davis (2015) observed that documenting was a means of seeking validation, Amelia said that she wrote and kept records to feel in control. It was also a drive to find order in disorder by organising personal information. In a recent everyday life information experience study, Miller et al. (2019) report that their participants used Twitter for memory keeping and reflecting on their moods over time.

Category 4: *Doing my own research* refers to everyday researching for health and wellness concerns via mobile devices (often via the Google search engine). Participants used the phrase "just Google" to describe how they researched. Sundin, Haider, Andersson, Carlsson, and Kjellberg (2017, p. 232) found that online searching is more often than not synonymous with Googling, stating "the algorithmic authority assigned to Google by our participants is very high". Their participants also searched to confirm "pre-established convictions" (p. 233). My participants typically trusted Google search results when researching and also sought to validate their beliefs about health and wellness.

Smeaton et al. (2017) found that their participants' smartphones provide "instant access to anything they want to know". I concur. One of the key features of *Going mobile for health and wellness* is convenience (which is discussed in Chapter 6). For my participants, the setting for doing their own research was sometimes the supermarket or the gym, or anytime they experienced symptoms.

Savolainen's (1995) commonly cited framework of Everyday Life Information Seeking (ELIS) is relevant to *Doing my own research* because participants engage with information to solve problems and orient themselves in their daily life. Savolainen (1995, p. 266) described

the subject area of "nonwork information seeking" as ambiguous because it is not associated with daily work or activities occurring at the workplace. More than 20 years later, this is still relevant because I observed the blurring of health concerns and amusement in participants' experience of searching online via mobile devices. Hence, I distinguished between "researching" and "browsing" as information actions. Even the line between work and "nonwork" researching was blurred because of constant mobile connectivity.

Particularly relevant to my study is Johnson, Andrews, and Allard's (2001) model for understanding cancer-related information seeking, the Comprehensive Model of Information Seeking (CMIS). The model details four "antecedents" for information seeking as:

- Demographics;
- Experience;
- Salience; and
- Beliefs.

Although the model focuses on cancer-related information, it holds true conceptually for *Doing my own research*. For example, *Demographics* such as age and gender influence both cancer-related information seeking behaviour and the experience of *Doing my own research*. My two oldest participants both used the phrase "at my age" which indicates that their advanced age was information about their health. Similarly, gender influences the experience. *Doing my own research* was more commonly experienced by female participants. While *Experience* refers to personal experience of cancer in the CMIS model, I view personal experience more broadly as *all* prior lived experience and I see personal demographics as part of personal experience. *Salience* refers to perception of threat or attention to specific cancer-related topics. *Going mobile for health and wellness* is a highly personal experience. Participants research because they perceive health threats and browse topics of interest relevant to their health concerns. The meaning of *Beliefs* as an antecedent for information seeking is more specific in the CMIS model because it refers to beliefs in the efficacy of medical procedures and self-efficacy (the feeling of competence) in shaping or controlling events. I viewed beliefs more broadly and identified them as an information type in my study (I outline personal experience and beliefs in section 7.4.2).

Similar to my study, White and Horvitz (2014, cited in Oh, Choi, & Kim, 2018) report that before patients visited healthcare facilities, they were more likely to search for health

information with smartphones. When *Going mobile for health and wellness*, participants did their own research before visiting their doctor, as well as after a consultation, for better understanding of their health concerns. In Denmark, Ravn Jakobsen, Hermann, Sondergaard, Wiil, and Clemensen (2018, p. 7) articulate why patients (who were women with osteoporosis) search for information on their mobile health app before a visit. They prepare and reassure themselves with information so that the consultation is "a more equal dialogue". This was also the case in my study.

Surrogate health information-seeking online is a common activity (Fox & Duggan, 2013; Sadasivam et al., 2013; Cutrona, Mazor, Vieux, Luger, Volkman, & Rutten, 2015). That is, looking for health information for someone else is common and surrogate seekers act as interpreters and translators of online information. A study in Singapore found that adult grandchildren often serve as translators/interlocutors and online health information seekers for their grandparents because they viewed it as their duty (Dutta, Kaur, Luk, Lin, & Lee, 2018). Translation entailed translating English language into mother tongue. From my study, it was evident that surrogate seekers (or, what I refer to as information caregivers) also need nuanced understanding of the people they are helping in order to share (or interpret) the information meaningfully.

Yates (2013) states that her participants experienced several roles as part of their health information literacy experience which included researcher, empowered and informed consumer, analyst, and interpreter. In addition to these roles, my participants were also information caregivers who did their own research on behalf of relatives.

Category 5: *Motivating myself* refers to motivating personal fitness and diet routines by *knowing myself*, feeling good and using mobile devices. Empirical studies relevant to this category were elusive in LIS.

Noteworthy was a doctoral study about the impact of body image on Fitbit use (Edwards, 2017). Consistent with my findings that physical and emotional feelings (as information types) motivate participants, Edwards (2017) found that feeling better in clothes as a result of exercise had a positive impact on participants' wellbeing, making them feel better and fitter. My participant Richard specified that "it's great when you buy a new pair of jeans one size down you haven't worn in ten years". He *felt* the benefits of weight loss.

The findings of Cox, McKinney, and Goodale (2017) on food logging app users' practices were relatable. In both our studies, self-tracking and seeing progress on mobile devices were

important in diet routines. I also concur that food logging is unusual because "the user has a central role in producing information, and that this information is often output to them in numbers or visualisations" (Cox et al., 2017, p. 195).

Lupton (2014, p. 78) states that dancers in her study responded to music and "in this way, external information (the music) informed the internal response". Likewise, participants in my study responded to music and musical cadences from their mobile devices to guide and motivate exercise routines.

Recent studies in areas such as medicine and mobile health report the results of interventions designed to increase physical activity with apps or wearable technology. Although these studies focus on diverse cohorts in healthcare settings, findings were generally consistent with aspects of *Motivating myself*. Research on everyday life is lacking, however. Most studies into self-care using mobile apps involve custom-designed apps for disease intervention (Anderson, Burford, & Emmerton, 2016).

Yurkiewicz, Simon, Liedtke, Dahl, and Dunn (2018) integrated mobile technologies (Fitbits and iPads with mobile health apps) into the cancer care experience of young patients. Most patients reported that they enjoyed the mobile technology and used the devices to track aspects of their health such as walking steps, calories and sleep (as well as for entertainment such as watching Netflix and playing games). The aspect "Feeling good about my routine" explored this topic. I found that participants enjoyed using their fitness and exercise apps because of the combination of disciplined tracking and entertaining (or motivating) factors such as music playlists, novelty, the outdoors or early morning sunshine.

Mobile devices are not only perceived as extensions of the mind and body but are also embedded in bodily rhythms and routines (Shankar, O'Brien, & Absar, 2018). My findings indicate that mobile devices are integrated into my participants' everyday lives (that is, not just for tracking fitness and diet routines). Walsh's (2012) finding about the outsourcing of memory to mobile devices is also relevant because my participants reported feeling "lost" (Aziz) and being "in a terrible position" (Miles) without their mobile devices that stored their personal information.

Finally, the aspect "Sharing my success selectively" aligns with the multidisciplinary study by Stragier, Vanden Abeele, and De Marez (2018). Investigating the motivations of recreational runners, they found that the social features of wearable devices and apps were used significantly less often than self-regulatory features such as tracking. Social network

sites were reserved for specific milestones or significant achievements. This particular finding was very similar to what my participants reported. Richard used the exact same word, that is, “milestones”.

7.4.2 A focus on ten facets

Following, I consider ten facets of the study’s findings in light of the existing literature. This includes the overarching information action and the nine main information types which participants integrated in various combinations when *Going mobile for health and wellness*.

Integrating internal and external information

Starting with the overarching information action in this study, integrating internal and external information, Lupton (2014) also found that the forms of information her participants used to compose music involved internal and external information. Internal information included thoughts, beliefs, feelings and emotions while external information such as music theory required learning.

In a health information literacy study, Yates, Partridge, and Bruce (2009, p. 279) explain that participants’ “information use resembled a process of filtration whereby information retrieved from external sources was screened against internal sources such as personal beliefs and values”. The concept of screening and filtrating is similar to integrating internal and external information in my study. I also found that participants focus and filter information according to their needs and interests.

Beliefs

Beliefs were a complex and influential information type when *Going mobile for health and wellness,* and this seems to be the case in other LIS studies. In my study, it was sometimes difficult to delineate beliefs, personal opinions and personal preferences because they were interrelated (and experienced individually and internally). Hughes (2014, p. 34) states that “our information experiences are coloured by the social, political technological and cultural influences of our daily lives”. I found that beliefs colour information experience, yet beliefs are not a focus in LIS studies.

As mentioned previously, Lupton (2014) and Yates, Partridge, and Bruce (2009) consider beliefs to be internal information. However, beliefs only received a brief mention in their respective studies.

Similar, if not synonymous with beliefs, Haidn et al. (2014, p. 17) refer to "ideals and values" as internal information that informed how a participant voted.

Walker (2012) noticed that parents' worldviews greatly affected their receptivity to types of information. In comparison, Davis (2015, p. 158) found that shared beliefs shaped the experience of new mothers in her study, stating that "the social media sisterhood is based on shared beliefs and approaches".

Lloyd (2014) found that cultural beliefs, norms and ways of knowing can shape how immigrants receive and understand health information. She sees beliefs about health as situated in culture. I found that personal experience (which includes aspects of culture such as family tradition and organisational culture) influenced participants' beliefs, and these beliefs shaped their information experience.

While Lloyd (2014) used a sociocultural approach, Smeaton et al. (2017) focused on socioeconomic factors that impact beliefs and information experience. They found that information poverty resulted from "a small world view". One of their participants believed that the home Wi-Fi connection or personal mobile phone using pre-paid data were the only trustworthy places to go online which limited her access to online information.

A German health information seeking study found that Turkish migrants possess traditional health-related beliefs and tend to attribute illness to external, fatalistic causes, that is, destiny, age and genes. "These health-related ideas go along with a reduced self-responsibility and a rather passive/less preventive attitude towards health behaviors" (Nölke, Mensing, Krämer, & Hornberg, 2015, p. 9). The literature suggests that beliefs can provide structure or barriers in everyday life.

Personal experience

Although the notion of personal experience as an information source is prevalent in LIS literature, the intimate links to personal biology and biography were more pronounced in the context of health and wellness. My participants drew on their personal experience, and in a similar fashion, Lupton (2014, p. 76) states:

> the information that composers [her participants] drew on included their musical life history, which is part of who they are. This was influenced by their life experience, personal aesthetic and outside events.

"Life experience" is similar to, if not synonymous with, "personal experience". "Personal aesthetic" is tied up with personal preferences. Personal experience and personal preferences as internal information types were prevalent in my study and they were intrinsic to participants' identity.

Davis (2015, p. 140) also refers to "own experience" as an information type. She states that mothers use "past experience" to inform decisions and that they value their own experiences more as they become more experienced at mothering.

In a health information literacy study, Yates (2013, p. 125) refers to people's "prior knowledge" and "personal health knowledge" which is accumulated understanding of what they have learnt and experienced in relation to health during the course of life.

Focused on professional experience, Olsson (2016, p. 412) refers to "personal expertise" in his research about the embodied information practices of field archaeologists. He states that reference works, whether printed or electronic, play little role in the initial identification at an archaeological dig. Rather, archaeologists used an "expert eye" on fragmentary finds such as pottery shards. In a professional context, personal experience can equate to expertise.

Different studies use different terms. This section's examples included "life history", "life experience", "own experience", "past experience", "prior knowledge", "accumulated understanding" and "personal expertise". These terms are synonymous with or closely related to personal experience. Yates' (2013, p. 125) research was about health information literacy, so she specified "personal health knowledge".

Personal preferences

Personal preferences as an information type only makes cameo appearances in LIS research. The aspect "Knowing my preferences" and following them was an important aspect in Category 1: *Knowing myself*. Davis' (2015, p. 232) aspect "Being informed by own preferences" echoed "Knowing my preferences". However, she was referring to social media posts. *Going mobile for health and wellness* included many personal preferences relating to mobile devices, health and information.

I described personal preferences as participants' specific, individual likes and dislikes. In Harlan's (2012) study, likes and dislikes were a feature but not a focus. Her teen content creators used online information they liked (such as artistic videos) as an inspirational model for their own creations. In online forums, the teens also expressed their likes and dislikes for online content in a more structured way by choosing like or dislike buttons, "thumbs up", or a

range of emoticons (p. 95). Profiles based on their preferences allowed teens to connect to like-minded communities.

In my study, it was difficult to delineate personal preferences, beliefs and opinions. The posting of opinions that expressed personal preferences was common in LIS studies about social media (Davis, 2015; Talip, 2016; Mulatiningsih, 2017; Miller et al., 2019). Considering their influence in everyday life, personal preferences deserve more attention.

Feelings (physical and emotional)

For my participants, both physical and emotional feelings were entangled in everyday health and wellness. Several LIS studies touch on this. However, they neither capture the important role of feelings (physical and emotional) in everyday health and wellness nor the engagement with mobile-mediated information for motivation and emotional reassurance.

Physical feelings feature strongly in Yates' (2013) study of the health information literacy experience of older Australians. Her category *Paying attention to bodily information* was about observing and listening to the body to learn about its health. Similar to participants in my study who observe their feelings (both physical and emotional), Yates (2013, p. 124) writes:

> People become aware of changes within themselves in either a physical or psychological sense, which represents information that a particular aspect of their health may need attention.

Yates (2013, p. 127) also states that the "reduction or elimination of pain or discomfort may similarly be perceived as information". In my study, feelings (physical or emotional) were also self-care indicators and motivators because participants want to feel good or, if not good, to feel relief from pain or discomfort.

Sensing by touch was an important information practice in the archaeological field. Olsson (2016, p. 413) states that the "feel in the hand" (or against the cheek) of an object was crucial to its identification.

Also physical in nature, Lupton (2014, p. 78) found that dancers in her study observed "tactile and kinaesthetic elements" that were fundamental to social dancing. These elements included the way the partner's body felt and the condition of the dance floor. In my study, Miles was highly aware of body movements in CrossFit, and his observations were visual and tactile in nature.

The experience of *Going mobile for health and wellness* was consistently associated with emotional feelings and participants were fluent at identifying emotions and expressing themselves via mobile-mediated communication. In comparison, music students in Lupton's (2014) study expressed their thoughts, feelings or moods creatively in their musical compositions. Davis' (2015) participants looked after their emotional and psychological wellbeing proactively. Posting to social media was a means of self-care by sense-making and cathartic purging.

Instinct and intuition (inner sense)

A few LIS studies recognise the importance of either instinct or intuition. Davis (2015) refers to mothers in her study following their instinct and she identified instinct as an information type. My participant Amelia, a mother of a young child, mentioned following her "instinct". The similarities in this particular example were clear because one of Davis' (2015, p. 140) participants described herself as "a research junkie" who should follow her instincts more. Amelia reflected that she researched too much during her pregnancy and early motherhood and wished that she had followed her instinct more.

Gillespie et al. (2017, p. 106) found that library and information professionals experience *Intuition as evidence* with one participant stating that she trusts her "gut" (which may be interpreted as an internal emotional feeling or inner sense). In comparison, Lloyd (2009, p. 407) refers to the "gut feelings" of ambulance officers that developed over time from their own bodily experiences which also included reading the environment or landscape.

In a study on women's information behaviour in the context of menopause, Genius (2012, p. 1560) identified intuition as "an intrapersonal and experientially based knowledge source".

Gunton et al. (2012, p. 127) describe "spiritual and introspective information" and the role it plays in spiritual wellness. This could also be considered inner sense or inspiration.

Inspirational and motivational information

Consistent with my findings, a perusal of LIS studies revealed that inspirational and motivational information presents in diverse forms, from diverse sources. However, these studies did not refer to inspirational information in the context of health and wellness. Motivational information was also discussed under Category 5: *Motivating myself* earlier in this chapter.

In a museum context, Latham et al. (2017) found that inspiration was a type of information rather than something separate from information. They state that inspiration can come from within or without. In my study, inspiration was usually sourced from external sources. Hence, I preferred to call it inspirational information rather than inspiration.

Similar to identifying inspiration as an information type, Harlan (2012, p. 120) states that *Information experienced as inspiration* was associated with "getting an idea" that came from teens' everyday lives. For example, inspiration came from movies, books, emotions and interaction with other people's designs.

In comparison, Davis (2015, p. 136) refers to "advice" and "ideas" as information types which can be "embedded in thoughts, suggestions or inspiration".

Gunton et al. (2012, p. 124) identified "inspired" as an information type. They describe it as "spiritual information received from personal conversation with God".

Data

For participants in this study, data refer specifically to fitness and diet information that is tracked and displayed by mobile apps and wearable technology. Data as an information type is important because it provides both motivation and guidance. While the concept of tracking data is common in human movement and exercise as well as mobile health literature, this was not the case in LIS research. I outlined relevant research previously in this chapter under Category 5: *Motivating myself*.

Guidance

Guidance is a relatively common external information type in other LIS studies. However, it is not always called "guidance" or typically identified as an information type. In her category *Paying attention to bodily information*, Yates (2013, p. 129) states that participants used information to provide "guidance or reinforcement" for their actions or behaviours.

Rather than the word "guidance", Davis (2015, p. 160) used the phrase "how to" several times. For example, she describes how her participant read a parenting blog about how to suppress lactation. She also refers to new mothers using information found in social media for "advice" or "ideas" on how to approach parenting.

Harlan's (2012, p. 99) participants referred to "how-to videos from hobbyists and professional teachers" to support their online content creation. My participants watched video sharing sites for health and wellness guidance.

Further afield, Charmaz collaborated in a recent constructivist grounded theory study about the experience of living with Parkinson's disease. One aspect of the experience echoed the feeling of being left in the lurch that my participant Ella described. Vann-Ward, Morse, and Charmaz (2017, p. 979) found that "without thoughtful explanations or guidance, people are left on their own to devise ways of making sense of dilemmas". Ella described finding her own way without guidance from her doctor.

Trivia

Trivia was an important social information type to participants. The emoji and the selfie, as kinds of trivia, have received the most attention in empirical literature because of their popularity worldwide. However, trivia (including emojis and selfies) has received little serious attention in LIS literature.

The aspect "Sharing light content" in Mulatiningsih's (2017) category *Sharing* is similar to the sharing of trivia and infotainment in my study. She found that her participants indulge their personal interests on social media by watching cat videos or reading about recipes or clothes they like. However, she did not identify trivia as important to a sense of wellbeing, probably because it was seen as indulgent in a professional context. Mulatiningsih's (2017) participants used selfies as a reflection tool and to promote positive public image. Unlike the conventional definition of selfies which involves posting on social media, my participant Zoe kept images on her smartphone camera roll.

Trivia such as humorous videos of friends, families and pets, as well as stunts and sports highlights, were important to Harlan's (2012) teen content creators. In the context of creating content online, trivia was neither trivial nor indulgent because it provided creative inspiration. My participants also experienced trivia as inspirational in social interactions.

In this section, I have presented a discussion that has identified immense scope for further study. In the LIS literature consulted, I found few studies focused on beliefs, personal preferences, inspiration, instinct, intuition, (tracking) data and trivia as information types. Participants valued these information types, yet they are undervalued and under researched in LIS. Considering their role in supporting, entertaining and socially connecting participants in their everyday health and wellness, these information types warrant serious attention.

To date, LIS lacks research on the information experience of constant mobile connectivity in everyday life. I found that this connectivity can relieve uneasy feelings and also enables the verification of facts while conversing in-person and on the go. More research is required on

the information experience of integrating everyday online and offline moments which can also be described as the sharing of attention between simultaneous virtual and in-person encounters. Empirical studies on the information experience of wearable technology and mobile apps in community settings are sparse. To my knowledge, this is the first study devoted to the information experience of using mobile devices for health and wellness in everyday life.

The mobile element, health element and information element have been studied separately in various cohorts by various disciplines. However, these studies do not provide a full picture of the phenomenon. *Going mobile for health and wellness* is a substantive theory that reveals the depth and diversity of my participants' individual and overall information experience.

This research has contributed unique and significant knowledge to our understanding of information and information experience in a specific context and cohort. Comparing my theory to existing research in this section contributes to this understanding and I have identified gaps for future research.

7.5 HOW DOES THIS STUDY CONTRIBUTE TO PRACTICE?

The findings from this study have the potential to benefit practitioners in many arenas who provide health and wellness support to consumers including health, health promotion, medicine, mobile health, libraries and government and independent agencies. Both mobile use and self-care are activities of mass participation globally, so any insights into understanding and supporting people in their everyday health and wellness would be of great benefit to many. In the following sections, I outline how this study's findings contribute to practice in two main areas: consumer health and library services.

7.5.1 Providing consumer health services

Mobile devices enable new opportunities for health consumers to connect with each other and health providers which supports their healthcare and self-care. Mobile technology supports social connection, information reference and research as well as health and fitness routines. It is common knowledge that an active lifestyle is conducive to health and wellness. Tracking via mobile devices provides guidance and motivation to maintain fitness routines. Motivation is integral to maintaining an active lifestyle as well as countering a sedentary one.

Organisations and government departments involved in the health and wellness of people can use findings from this study to inform best practice.

Connecting with health consumers may require "Going mobile". It is important to be in sync with health consumers' personal preferences and to actively engage them with information in multiple formats including mobile-mediated information. My findings indicate that these health programs and services should be *personal*, *purposeful* and *convenient*. Below, I outline two main areas of consideration that involve health consumers' information experience and the types of information they use and prefer.

Considering the information experiences of health consumers

This study contributes to a small body of research on people's everyday information experiences. When designing health care programs and services, it is important to consider the information experience of individuals (as well as health status, health literacy and demographics) in the consumer group. Both personal biology and biography influence information experience profoundly.

My study contributes five distinct categories of experience which could inform healthcare organisations' provision of programs and services to consumers. These categories combined with the *Typology of information actions* illustrate in detail what people do with information when *Going mobile for health and wellness*.

Specifically, my participants (who are health consumers) valued what Ravn Jakobsen et al. (2018) referred to as "a more equal dialogue" during a medical consultation which is information *per se* for healthcare providers. In this respect, important information actions include communicating, researching and evaluating. For health consumers, being informed prior to a consultation and the nature of communication with medical professionals are important. Medical consultation via mobile device and health concern-specific mobile apps may also be offered to health consumers.

Given the value participants place on their inner social circle, healthcare providers may consider identifying friends and relatives who are willing and able to help individual health consumers with all three information actions (that is, communicating, researching and evaluating). Researching and communicating via mobile devices are major ways of evaluating information and making sense of health concerns.

Considering a wider range of information types

My findings revealed that information types are highly diverse and highly subjective, depending on each individual in context. The *Typology of information* contributes to our understanding of the nature and value of both internal and external information in the context of using mobile devices for health and wellness. Based on findings, everyday health consumers may appreciate a wide range of information types *and* formats for health and wellness including (but not limited to) videos, podcasts, online forums, social media and apps. In-person guidance could also be available. Miles highlighted the importance of in-person, hands-on advice in fitness training in tandem with his mobile apps. Often, participants found a *combination* of information types motivating.

Healthcare providers could also consider influential internal information types such as beliefs, personal experience, personal preferences and feelings (physical and emotional) when designing programs and services. An understanding of these internal information types may guide program design and approach to health consumers. Similarly, an understanding of how demographics impact information experience is important. For example, females in my study were more involved in researching online for health and wellness. Some were also family-focused information caregivers who used internal information types such as instinct and intuition.

My participants (who are health consumers) value relevant, trustworthy information when *Going mobile for health and wellness* because they often seek both practical guidance and emotional reassurance. Health consumers value text-based information that is readily accessible and easily readable from their mobile devices. Images are also important. Dee highlighted the importance of *seeing* images of skin cancer as well as the effects of the black salve in images and audio-visual format. She sought mobile-mediated information on both mainstream and alternative health. My cohort of health consumers engaged with a wide range of information types and a myriad of topics.

7.5.2 Providing library services

Discussion about mobile devices is often framed in terms of opportunities or imperatives for libraries (Howard & Bussell, 2018). Either way, to remain relevant, libraries cannot afford to ignore the latest mobile technologies in a culture of connectivity. The findings from my study have the potential to benefit LIS professionals who are committed to what Harland (2017, p. 172) calls “continuously reinventing” the library. Many of the implications for practice in

consumer health also apply to LIS, especially in medical, health and public libraries with health advocacy roles. Likewise, considering the high level of smartphone ownership, actively engaging with library users may entail "Going mobile" (for health and wellness and for library services in general).

"There is a responsibility inherent in consumer health librarianship not found in other reference work, as patrons' very lives may be at stake" (Dickenson, Huddleston, Johnson, Kumagai, & Lopez, 2014, p. 84). Given the popularity and convenience of text messaging, libraries may consider providing or enhancing texting-based reference services that help users locate and evaluate trustworthy health and wellness information. Based on my findings, the service should include reference on both mainstream and alternative health.

Given the popularity of mobile-mediated trivia and small talk in my study, library practitioners who wish to connect with their users (socially and technically) may consider programs and services that are amusing, informal, multi-media and mobile-mediated. Libraries may consider developing texting campaigns or app-based programs for health promotion. Libraries could send out customised text messages about health news or motivational information related to personal health and wellness goals. I suggest that mobile-mediated library programs and services would complement in-person interactions with librarians and encourage connection and engagement with libraries.

7.6 IMPLICATIONS FOR INFORMATION EXPERIENCE

This study presents an original substantive theory which provides understanding of the nature of information experience in using mobile devices for health and wellness. In so doing, this study is significant in three main ways. First, it provides understanding of the information experience of a specific cohort in a specific context. Second, it extends and enriches understanding of information experience as a broad research object which, in this study, presented an unconventional yet faithfully rendered view of information which offers an alternative to the traditional notions of information in LIS. Rather, this study investigated what people actually experienced as informing from their perspectives which encouraged empathetic, nuanced understanding. Essentially, I considered participants to be experts in their experience of the phenomenon. Third, this study contributes to the discourse of information experience as a research domain. In particular, I suggest that a rethinking of what constitutes a context in the information experience domain is required. Through my study, I

found that *Going mobile for health and wellness* involves a complex of contexts and that my participants experienced multiple contexts simultaneously. For example, it was common for my participants to experience work and everyday contexts concurrently because of the convenience of mobile devices and a culture of connectivity.

Towards the end of this study, I viewed participants as experiencing a complex of information experiences in a complex of contexts. I viewed the mobile element and the health element (of the studied experienced) as different contexts and felt that each category of experience was a different yet related context. For example, participants were *Doing their own research* in the context of *Facing uncertainty* and vice versa. Chronic, unresolved pain is an extreme experience that could also be seen as a context. I envision that research in new cohorts and new contexts will continue refining or redefining information experience as a research object and research domain.

7.7 RESEARCH LIMITATIONS

This study has several limitations. When considering this study's findings, four main issues should be noted. First, the research findings provide a snapshot in time of a small-scale, geographically limited study. (The scale was limited in favour of rich, qualitative data). The number of participants was modest. The selection of participants was largely from my existing contacts and not intended to be representative of the user population. Rather, by design, the study was an intense focus on the experience of the participants. Although I consider the selection of participants in this study to be diverse, I did not and could not capture the experience of all segments of the user population. Many biological and biographical factors impact participants' information experience. It was beyond the scope of the study to focus on all these factors.

Second, regarding participant responses, I relied on participants' ability to recall and retell their experiences. I acknowledge that participants may not have discussed or fully disclosed personal health and wellness experiences. The face-to-face requirement of interviews may also have imposed limitations on the participant population as a certain degree of mobility was required for attendance.

The third issue to consider is that the use of mobile devices is neither universal nor static. Usage depends on economic and cognitive states. Even among users, personal use varies in terms of frequency, duration, enthusiasm, competency and informational content. Mobile

phone provider plans also vary and thus varying costs and Internet access may affect usage. Moreover, mobile technologies are continually evolving and converging. Relating to the first issue, this research was limited to the timeframe of the study. I focused on current mobile devices that participants used. I did not focus on non-users nor their reasons for non-use.

Finally, (also relating to the first issue), *Going mobile for health and wellness* is a substantive grounded theory that was unique and specific to the context and cohort of participants. Hence, findings may be only partially applicable to other contexts.

7.8 FUTURE DIRECTIONS

Given the newness of the information experience domain, there is immense scope for further study. In the following, I suggest future avenues for research integrated with my reflections on information experience.

Investigating information experience in new contexts, cohorts and cultures

Hughes (2014, p. 34) described information experience as "a complex of information experiences, as contextualised instances of using information. It integrates all information-related actions, thoughts, feelings". Although I am unsure if "complex" refers to a system, collection or complexity, the term aptly describes information experience as I understand it from my study. Thus, all these meanings of the word apply, and future research may confirm if this is the case in other contexts, cohorts and cultures. Future research may address the phenomenon in contexts such as disability, socio-economic disadvantage, unemployment or retirement. A focus on men's health exploring the role and nature of boy talk or guy talk would provide valuable insights. Perhaps, the everyday information experience of alternative (or complementary) health would be of interest. Or, the information experience of new expatriates.

Investigating information experience in new technology contexts

Future research may investigate the information experience of being in two or more contexts simultaneously (or intermittently) or what Demasson (2014, p. 247) refers to as a "cross-contextuality". In comparison, Battard and Mangematin (2013, p. 232) noted the decontextualised interactions of mobile users, stating that "people can bring their environments wherever they go". The medium of the mobile device is conducive to the blurring of information, communication and entertainment in everyday life. New technologies may provide new contexts and intriguing information experiences to research.

Redefining what constitutes a context

I suggest that the conventional information literacy research concept of "context" requires rethinking because this study provides insight into the blurring of the three contexts of education, work and everyday life. More information experience research is required to establish what constitutes a context and these may either be an extension of or independent of the conventional contexts in information literacy research.

Investigating information experience as a multi-sensory experience

Arguably, each and every waking experience in life involves interacting with information of some kind in some way. The setting or context offers information and Lloyd (2006; 2007) advocates a whole-body approach to understanding the nature of information environments. Each and every experience involves the natural senses (or at least one of them). From this perspective, each and every experience is an information experience and being amidst information is the natural state of being. However, the ability to experience information is limited by the ability to process and assign meaning to it. As Andrejevic (2013, p. 2) states "it has always been impossible to fully absorb the information by which we are surrounded". Future research may investigate information from this perspective, that is, viewing information experience as a multi-sensory experience.

Refining or redefining information experience as a research object and research domain

I realised the limits of language when trying to describe participants' internal information types and the complexity of information actions. Researching and explaining information experience is challenging. Future research may devise fresh ways of studying this research object using different approaches. In contrast to a "snapshot" in time approach, a longitudinal study of information experience over time may be a new direction. Future research may provide novel insights into information experience as both a research object and as a domain. These studies may refine or redefine the boundaries of the information experience domain.

Investigating the many aspects of *Going mobile for health and wellness*

More research is required on the many lived experiences that shape the overall information experience of *Going mobile for health and wellness* such as Googling during dinner conversations and venting frustrations via text message. Participants appreciated the audio-visual aspects of their mobile devices. For more insights into information experience in everyday life, future inquiries could continue to go beyond traditional text-based information and focus on information types such as amusing videos, emojis or smartphone snapshots. I

also suggest a research focus that goes beyond these tangible forms of information to investigate information types such as beliefs, opinions, personal preferences, empathy, curiosity, instinct, intuition or inspiration and discern how they relate in everyday contexts.

For my participants, *Going mobile for health and wellness* is a personal, purposeful and convenient experience. Intrinsic to convenience, constant connectivity impacted all categories of their experience and participants often straddled contexts as they integrated online and offline moments. Future research may investigate the information experience of attending events such as a graduation, wedding or birthday party virtually.

7.9 CONCLUSION

The theory of *Going mobile for health and wellness* offers what Charmaz (2014, p. 17) couches as "an interpretive portrayal of the studied world". From the outset, I aimed to develop a theory that was relevant and relatable to people in everyday life. Although my grounded theory is substantive rather than generalisable, I have outlined how it is relatable to other theories and research. At a personal level, I felt that my theory was also relevant and relatable to my everyday life. Thus, I will tell you how I related personally to four of the five categories of experience towards the end of my study. On reflection, the timing of this stressful situation meant that I had a language from my study to describe the nature of my information experience.

A few weeks before my final seminar, my father had open-heart surgery in Brisbane while I was residing with my family of four in Colorado. Although he was stoic, we were *facing uncertainty* and anxiety about his health. His health concern was our concern. I was *doing my own research* about the surgery (while I was doing my own academic research) because I wanted to know *for* myself (Category 1: *Knowing myself*) the procedure and risks involved for a patient in his eighties. We video messaged Mum and Dad from my tablet computer before, and thankfully, after his surgery. This made us *feel connected* and reassured. More than this, it made us feel that we were with them in a way, despite the distance. My nine-year-old son was particularly impressed when Granddad revealed his chest scar over the video call. We knew he was recovering when he showed us the crooked, framed picture on the wall of his hospital room that bothered him. He has an eye for symmetry.

In this instance, information had a social, familial and emotional currency. By "currency", I mean that information was immediate and of value to us. For participants, most

communication for health and wellness revolved around “talking”. They enjoy sharing informal and basic information using small talk (informal, mobile-mediated conversation) and rituals that support social connection such as exchanging photographs and trivia. During trying and uncertain times, small talk and seemingly trivial details can be highly meaningful and have a big social and emotional impact.

The findings from this research study provide us with empirical and theoretical evidence that contribute to the new and evolving information experience research domain. Findings may also have broader implications in information studies and other research areas such as consumer health information research and mobile use. I hope research that supports a diverse range of people (such as my participants) in their everyday health and wellness continues and diversifies. I hope my contribution to research encourages more research.

REFERENCES

American Medical Association. (1999). Health literacy: Report of the Council on Scientific Affairs. *Journal of the American Medical Association, 281*(6), 552-557.

Anderson, K., Burford, O., & Emmerton, L. (2016). Mobile health apps to facilitate self-care: A qualitative study of user experiences. *PLoS ONE, 11*(5), e0156164.

Andrejevic, M. (2013). *Infoglut: How too much information is changing the way we think and know*. New York: Routledge.

Andretta, S. (2012). *Ways of experiencing information literacy*. Oxford, UK: Chandos.

Annells, M. (1996). Grounded theory method: Philosophical perspectives, paradigm of inquiry, and postmodernism. *Qualitative Health Research, 6*(3), 379-393. doi:10.1177/104973239600600306

Anwar, M., Joshi, J., & Tan, J. (2015). Anytime, anywhere access to secure, privacy-aware healthcare services: Issues, approaches and challenges. *Health Policy and Technology, 4*, 299-311. doi:10.1016/j.hlpt.2015.08.007

Association of College and Research Libraries (ACRL). (c2000). *Information literacy competency standards for higher education.* Retrieved from http://www.ala.org/acrl/standards/informationliteracycompetency

Avancha, S., Baxi, A., & Kotz, D. (2012). Privacy in mobile technology for personal healthcare. *ACM Computing Surveys, 45*(1). Retrieved from https://www.cs.dartmouth.edu/~dfk/papers/avancha-survey.pdf

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioural change. *Psychological Review, 84*(2), 191-215. doi:10.1037/0033-295X.84.2.191

Barkhuus, L., & Polichar, V. (2011). Empowerment through seamfulness: Smart phones in everyday life. *Personal and Ubiquitous Computing, 15*(6), 629-639. doi:10.1007/s00779-010-0342-4

Barton, A. J. (2012). The regulation of mobile health applications. *BMC Medicine, 10*(46), 1-5. doi:10.1186/1741-7015-10-46

Battard, N., & Mangematin, V. (2013). Idiosyncratic distances: Impact of mobile technology practices on role segmentation and integration. *Technological Forecasting and Social Change*, *80*(2), 231-242. doi:10.1016/j.techfore.2011.11.007

Baysari, M. T., Adams, K., Lehbom, E. C., Westbrook, J. I., & Day, R. O. (2014). iPad use at the bedside: A tool for engaging patients in care processes during ward rounds? *Internal Medicine Journal*, *44*(10), 986-990. doi:10.1111/imj.12518

Bazeley, P., & Jackson, K. (2013). *Qualitative data analysis with NVivo* (2nd ed.). London, UK: Sage.

Beddall-Hill, N. L., Jabbar, A., & Al Shehri, S. (2011). Social media devices as tools for qualitative research in education: iPhones and iPads in ethnography, interviewing, and design-based research. *Journal of the Research Center for Educational Technology*, *7*(1), 67-89.

Beretta, P., Sayyad Abdi, E., & Bruce, C. (2018) Immigrants' information experiences: An informed social inclusion framework. *Journal of the Australian Library and Information Association*, *67*(4), 373-393. doi:10.1080/24750158.2018.1531677

Birks, M., & Mills, J. (2011). *Grounded theory: A practical guide*. London, UK: Sage.

Blom, J. O., & Monk, A. F. (2003). Theory of Personalization of Appearance: Why Users Personalize Their PCs and Mobile Phones. *Human-Computer Interaction*, *18*(3), 193-228. doi: 10.1207/S15327051HCI1803_1

Bratucu, R., Gheorghe, I. R., Purcarea, R. M., Gheorghe, C. M., Popa Velea, O., & Purcarea, V. L. (2014). Cause and effect: The linkage between the health information seeking behavior and the online environment- a review. *Journal of Medicine and Life*, *7*(3), 310-316.

Bruce, C. (1997). *The seven faces of information literacy*. Adelaide, Australia: Auslib Press.

Bruce, C. (2000). Information literacy research: Dimensions of the emerging collective consciousness. *Australian Academic and Research Libraries*, *31*(2), 91-109. Retrieved from http://archive.alia.org.au/sections/ucrls/aarl/

Bruce, C. (2008). *Informed learning*. Chicago, IL: Association of College and Research Libraries.

Bruce, C. (2014). Conference keynote: Information literacy research and practice: An experiential perspective. In S. Kurbanoğlu, E. Grassian, D. Mizrachi, R. Catts, S. Akça, & S. Spiranec (Eds.) *Worldwide Commonalities and Challenges in Information Literacy Research and Practice* (pp. 11-30). Istanbul, Turkey: Springer. Retrieved from https://eprints.qut.edu.au/64624/

Bruce, C., & Partridge, H. (2011). Identifying and delineating information experience as a research domain: A discussion paper. Paper presented at *Social Media and Information Practices Workshop*, Boras, Sweden. (Unpublished) Retrieved from http://eprints.qut.edu.au/47204/

Bruce, C., Davis, K., Hughes, H., Partridge, H., & Stoodley, I. (2014a). Information experience: Contemporary perspectives. In C. Bruce, K. Davis, H. Hughes, H. Partridge, & I. Stoodley (Eds.), *Information experience: Approaches to theory and practice. (Library and Information Science, Volume 9*) (pp. 3-15). Bingley, UK: Emerald.

Bruce, C., Davis, K., Hughes, H., Partridge, H., & Stoodley, I. (2014b). Information experience: New perspectives and research directions. In C. Bruce, K. Davis, H. Hughes, H. Partridge, & I. Stoodley (Eds.), *Information experience: Approaches to theory and practice. (Library and Information Science, Volume 9*) (pp. 315-320). Bingley, UK: Emerald.

Bunce, S., Partridge, H. L., & Davis, K. (2012). Exploring information experience using social media during the 2011 Queensland floods: A pilot study. *Australian Library Journal, 61*(1), 34-45.

Bundy, A. (Ed.). (2004). *Australian and New Zealand information literacy framework: Principles, standards and practice* (2nd ed.), Australian and New Zealand Institute for Information Literacy & Council of Australian University Librarians, Adelaide. Retrieved from: http://www.library.unisa.edu.au/infoskills/infolit/infolit-2nd-edition.pdf

Burford, S., & Park, S. (2014). The impact of mobile tablet devices on human information behaviour. *Journal of Documentation, 70*(4), 622-639. doi:10.1108/JD-09-2012-0123

Burnham, E., & Peterson, E. B. (2005). Health information literacy: A library case study. *Library Trends, 53*(3), 422-433. Retrieved from http://www.press.jhu.edu/journals/library_trends/

Butt, S., & Phillips, J. G. (2008). Personality and self reported mobile phone use. *Computers in Human Behavior, 24*(2), 346-360. doi:10.1016/j.chb.2007.01.019

Chan, M. (2018). Mobile-mediated multimodal communications, relationship quality and subjective well-being: An analysis of smartphone use from a life course perspective. *Computers in Human Behavior, 87*, 254-262. doi:10.1016/j.chb.2018.05.027

Charmaz, K. (1990). Discovering chronic illness: Using grounded theory. *Social Science & Medicine, 30*(11), 1161-1172. Retrieved from http://www.journals.elsevier.com/social-science-and-medicine/

Charmaz, K. (2000). Grounded theory: Objectivist and constructivist methods. In N. K. Denzin, & Y. S. Lincoln (Eds.), *Strategies of Qualitative Inquiry 2nd edition* (pp. 249-291). Thousand Oaks, CA: Sage.

Charmaz, K. (2006). *Constructing Grounded Theory: A practical guide through qualitative analysis*. London, UK: Sage.

Charmaz, K. (2014). *Constructing Grounded Theory* (2nd ed.). Los Angeles, CA: Sage.

Charmaz, K. (2008). Grounded theory as an emergent method. In S. N. Hesse-Biber, & P. Leavy (Eds.), *Handbook of Emergent Methods* (pp. 155-170). New York, NY: Guilford Press.

Charmaz, K. (2009). Shifting the grounds. In J. M. Morse, P. Noerager Stern, J. Corbin, B. Bowers, K. Charmaz, & A. E. Clarke (Eds.), *Developing grounded theory: The second generation* (pp. 127-193). Walnut Creek, CA: Left Coast Press.

Cheever, N. A., Rosen, L. D., Carrier, M., & Chavez, A. (2014). Out of sight is not out of mind: The impact of restricting wireless mobile device use on anxiety levels among low, moderate and high users. *Computers in Human Behavior, 37*: 290-297.

Cho, J., Lee, E., &, Quinlan, M. (2015). Complementary relationships between traditional media and health apps among American college students, *Journal of American College Health, 63*(4), 248-257. doi:10.1080/07448481.2015.1015025

Choi, S. (2016). The flipside of ubiquitous connectivity enabled by smartphone-based social networking service: Social presence and privacy concern. *Computers in Human Behavior, 65*: 325-333. doi:10.1016/j.chb.2016.08.039

Chomutare, T., Fernandez-Luque, L., Arsand, E., & Hartvigsen, G. (2011). Features of mobile diabetes applications: Review of the literature and analysis of current applications compared against evidence-based guidelines. *Journal of Medical Internet Research, 13*(3), pe65. doi:10.2196/jmir.1874

Corbin, J., & Morse, J. M. (2003). The unstructured interactive interview: Issues of reciprocity and risks when dealing with sensitive topics. *Qualitative Inquiry, 9*(3), 335-354.

Counts, S., & Fisher, K. E. (2010). Mobile social networking as information ground: A case study. *Library & Information Science Research, 32*(2), 98-115. Retrieved from http://www.journals.elsevier.com/library-and-information-science-research/

Cox, A. M., McKinney, P., & Goodale, P. (2017). Food logging: An information literacy perspective. *Aslib Journal of Information Management, 69*(2), 184-200. doi:https://doi.org/10.1108/AJIM-12-2016-0208

Crotty, M. (1998). *The foundation of social research: Meaning and perspective in the research process*. London, UK: Sage.

Cutrona, S., Mazor, K., Vieux, S., Luger, T., Volkman, J., & Rutten, L. (2015). Health information-seeking on behalf of others: Characteristics of "surrogate seekers". *Journal of Cancer Education*, *30*(1), 12-19.

Davis, K. E. (2015). *The information experience of new mothers in social media: A grounded theory study.* (Doctoral dissertation). Retrieved from https://eprints.qut.edu.au/86784/

DeBuono, B. A. (2006). Another hidden epidemic: Limited health literacy. *Medscape General Medicine, 8*(4), 27. Retrieved from http://www.medscape.com

Deloitte (2017). *Global mobile consumer trends, 2nd edition: Mobile continues its global reach into all aspects of consumers' lives.* Retrieved from https://www2.deloitte.com/tr/en/pages/technology-media-and-telecommunications/articles/global-mobile-consumer-survey-2017.html

Deloitte Access Economics (2013). *Mobile nation: The economic and social impacts of mobile technology*. Retrieved from https://www.deloitteaccesseconomics.com.au/uploads/File/DAE%20-%20AMTA%20report%202013.pdf

Demasson, A. (2014). *Information literacy and the serious leisure participant: Variation in the experience of using information to learn.* (Doctoral dissertation). Retrieved from https://eprints.qut.edu.au/78615/

Demasson, A., Partridge, H., & Bruce, C. (2011). *Informed leisure: examining the ways in which people engaged in a serious leisure activity, within the area of heritage, experience information in order to learn*. Paper presented at the Information: Interactions and Impact (i3) Conference, Aberdeen, UK. Retrieved from http://www.i3conference2011.org.uk/

Denzin, N. K. (2009). *Qualitative inquiry under fire: Toward a new paradigm dialogue*. Walnut Creek, CA: Left Coast Press.

Denzin, N. K., & Lincoln, Y. S. (2008). *The landscape of qualitative research*. Thousand Oaks, CA: Sage.

Devine, S., Bull, S., Dreisbach, S., & Shlay, J. (2014). Enhancing a teen pregnancy prevention program with text messaging: Engaging minority youth to develop TOP Plus Text. *Journal of Adolescent Health*, *54*(3), S78-S83. doi:10.1016/j.jadohealth.2013.12.005

Dickenson, N., Huddleston, C., Johnson, J., Kumagai, G., & Lopez, E. (2014). Health reference service. In M. Spatz (Ed.), *The Medical Library Association Guide to Providing Consumer and Patient Health Information* (pp. 87-104). Ann Arbor, MI: Rowan & Littlefield.

Doyle, C. S. (1992). *Outcome measures for information literacy within the national education goals of 1990. Final report to National Forum on Information Literacy. Summary of findings*. National Forum on Information Literacy. ED351033.

Dutta, M. J., Kaur, S., Luk, P., Lin, J., & Lee, S. T. (2018). Health information seeking among Singaporeans: Roles and collective contexts. *Health Communication, 33*(4), 433-442. doi:10.1080/10410236.2016.1278493

Edwards, A. (2017). The impact of body image on Fitbit use: A comparison across genders. *Health Information & Libraries Journal*, *34*(3), 247-251.

Edwards, S. (2006). *Panning for gold: Information literacy and the net lenses model*. Adelaide, Australia: AUSLIB Press.

Eisenberg, M. B., & Berkowitz, R. E. (1990). *Information problem-solving: The big six skills approach to library and information skills instruction*. Norwood, NJ: Ablex.

Ek, S., & Heinström, J. (2011). Monitoring or avoiding health information - the relation to inner inclination and health status. *Health Information & Libraries Journal, 28*(3), 200-209. doi:10.1111/j.1471-1842.2011.00947.x

Ellis, D. (1990). *The derivation model for information retrieval system design.* (Doctoral dissertation). Retrieved from http://etheses.whiterose.ac.uk/2975/

Ellis, D. (1993). Modeling the information-seeking patterns of academic researchers: A grounded theory approach. *The Library Quarterly, 63*(4), 469–486. Retrieved from http://www.press.uchicago.edu/ucp/journals/journal/lq.html

Eriksson-Backa, K., Ek, S., Niemelä, R., & Huotari, M. L. (2012). Health information literacy in everyday life: A study of Finns aged 65–79 years. *Health Informatics Journal, 18*(2), 83-94. doi:10.1177/1460458212445797

Fafeita, J., & Lloyd, A. (2012). Plating up information literacy as a social practice: A slice of the literature. *Australian Academic and Research Libraries 43*(2), 92-101.

Fox, S., & Duggan, M. (2012). *Mobile health 2012.* Pew Internet & American Life Project. Washington, D.C. Retrieved from http://www.pewinternet.org/Reports/2012/Mobile-Health.aspx

Fox, S., & Duggan, M. (2013). *Health online 2013*. Pew Internet & American Life Project. Washington, D.C. Retrieved from https://www.pewinternet.org/2013/01/15/health-online-2013/

Fraser-Arnott, M. A. (2016). *Personalizing professionalism: The professional identity experiences of LIS graduates in non-library roles.* (Doctoral dissertation). Retrieved from https://eprints.qut.edu.au/97526/

Gabriels, K., & Moerenhout, T. (2018). Exploring entertainment medicine and professionalization of self-care: interview study among doctors on the potential effects of digital self-tracking. *Journal of Medical Internet Research, 20*(1), e-10. doi:10.2196/jmir.8040

Gair, S. (2012). Feeling their stories: Contemplating empathy, insider/outsider positionings, and enriching qualitative research. *Qualitative Health Research, 22*(1), 134-143. doi: 10.1177/1049732311420580

Galletta, A. (2013). *Mastering the Semi-Structured Interview and Beyond: From Research Design to Analysis and Publication*. New York; London, UK: NYU Press. Retrieved from http://www.jstor.org.ezp01.library.qut.edu.au/stable/j.ctt9qgh5x

Garner, S. D. (2006). *High-Level Colloquium on Information Literacy and Lifelong Learning: Report of a Meeting sponsored by the United Nations Education, Scientific, and Cultural Organisation (UNESCO), National Forum on Information Literacy (NFIL) and the International Federation of Library Associations and Institutions (IFLA) Alexandria*. Retrieved from http://www.ifla.org/publications/high-level-colloquium-on-information-literacy-and-lifelong-learning

Genius, S. K. (2012). Constructing "sense" from evolving health information: A qualitative investigation of information seeking and sense making across sources. *Journal of the American Society for Information Science 63*(8), 1553-1566. doi:10.1002/asi.22691

Germeni, E., & Schulz, P. J. (2014). Information seeking and avoidance throughout the cancer patient journey: two sides of the same coin? A synthesis of qualitative studies. *Psycho-Oncology, 23*, 1373–1381. doi:10.1002/pon.3575

Geva, S., Huang, D., & Trotman, A. (2008). Efficient information seeking on a mobile device. In K. Chan, X. Xie, M. Etoh, W. C. Lee, & F. Tsai (Eds.), Paper presented at *Proceedings of the 31st Annual International ACM SIGIR Conference: Workshop on Mobile Information Retrieval (MobIR'08),* Singapore. Retrieved from http://eprints.qut.edu.au/30539/

Gillespie, A. M., Miller, F., Partridge, H. L., Bruce, C. S., & Howlett, A. (2017). What do Australian library and information professionals experience as evidence? *Evidence Based Library and Information Practice, 12*(1), 97-108.

Glaser, B. G. (1978). *Theoretical sensitivity: Advances in the methodology of grounded theory*. Mill Valley, CA: Sociology Press.

Glaser, B. G. (1992). *Basics of grounded theory analysis: Emergence vs. forcing*. Mill Valley, CA: Sociology Press.

Glaser, B. G. (1998). *Doing grounded theory: Issues and discussions*. Mill Valley, CA: Sociology Press.

Glaser, B. G. (2001). *The grounded theory perspective: Conceptualization contrasted with description*. Mill Valley, CA: Sociology Press.

Glaser, B. G. (2002). Constructivist grounded theory? *Forum: Qualitative Social Research, 3*(3), Retrieved from http://www.qualitative-research.net/index.php/fqs/article/view/825/1792

Glaser, B. G. (2009). The novice GT researcher. *The Grounded Theory Review: An International Journal*, *8*(2), 1-21. Retrieved from https://doaj.org/article/58da012869bb44ef899178fdf00189ad

Glaser, B. G. (2010). The future of grounded theory. *The Grounded Theory Review*, *9*(2), 1-14. doi:10.1177/104973299129122199

Glaser, B. G., & Strauss, A. L. (1965). *Awareness of dying*. Chicago IL: Aldine.

Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory.* Chicago, IL: Aldine.

Glaser, B. G., & Strauss, A. L. (1968). *Time for dying*. Chicago IL: Aldine

Godbold, N. (2013). Listening to bodies and watching machines: Developing health information skills, tools and services for people living with chronic kidney disease. *Australian Academic & Research Libraries*, *44*(1), 14-28. doi:10.1080/00048623.2013.773859

Gorichanaz, T. (2015). Information on the run: Experiencing information during an ultramarathon. *Information Research, 20*(4). Retrieved from http://www.informationr.net/ir/20-4/paper697.html#.XJFEkyhKiUk

Griffey, J. (2012). The rise of the tablet. *Library Technology Reports*, *48*(3), 7-13.

Gunton, L. (2011). Religious information literacy: Using information to learn in church community. *Australian Library Journal, 60*(2), 155-164. Retrieved from http://alia.org.au/publishing/alj/

Gunton, L., Bruce, C., & Stoodley, I. (2012). Experiencing religious information literacy: Informed learning in church communities. *The Australian Library Journal, 61*(2), 119-132. doi:10.1080/00049670.2012.10722681

Haidn, I., Partridge, H., & Yates, C. (2014). Informed democracy: Information experiences during the 2012 Queensland election. In J. T. Du, Q. Zhu, & A. Koronios (Eds.), *Library and Information science Research in Asia-Oceania: Theory and Practice* (pp. 8-23), Hershey, PA: IGI Global.

Hammond, P. A. (2005). Consumer health librarian. *Reference Services Review, 33*(1), 38-43. doi:10.1108/00907320410519469

Harlan, M. A. (2012). *Information practices of teen content creators: The intersection of action and experiences -- a grounded theory study*. (Doctoral dissertation). Retrieved from https://eprints.qut.edu.au/57125/

Harlan, M. A. (2014). Information experiences of teen content creators Information experience: New perspectives and research directions. In C. Bruce, K. Davis, H. Hughes, H. Partridge, & I. Stoodley (Eds.), *Information experience: Approaches to theory and practice. (Library and Information Science, Volume 9*) (pp. 101-115). Bingley, UK: Emerald.

Harland, F. M. (2017). *How the university librarian ensures the relevance of the library to stakeholders: A constructivist grounded theory.* (Doctoral dissertation). Retrieved from https://eprints.qut.edu.au/106745/

Harling, M. R., & Turner, W. (2012). Student nurses' attitudes to illicit drugs: A grounded theory study. *Nurse Education Today, 32*(3), 235-240. 10.1016/j.nedt.2011.05.002

Hashizume, A., Yamanaka, T., & Kurosu, M. (2011). Real user experience of ICT devices among elderly people. In M. Kurosu (Ed.), Paper presented at *Proceedings of Human Centered Design: Second International Conference, HCD 6776* (pp. 227-234). Orlando, FL. doi:10.1007/978-3-642-21753-1_26

Havelka, S. (2013). Mobile information literacy: Supporting students' research and information needs in a mobile world. *Internet Reference Services Quarterly*, *18*(3-4), 189-209. doi: 10.1080/10875301.2013.856366

Havelka, S., & Verbovetskaya, A. (2012). Mobile information literacy: Let's use an app for that! *College & Research Libraries News*, *73*(1), 22-23. doi:10.5860/crln.73.1.8689

Holton, J. A. (2007). The coding process and its challenges. In A. Bryant, & K. Charmaz (Eds.), *The SAGE handbook of grounded theory* (pp. 265-287). London, UK: Sage.

Hong, S. G., Trimi, S., & Kim, D. W. (2016). Smartphone use and internet literacy of senior citizens. *Journal of Assistive Technologies, 10*(1), 27-38. doi:10.1108/JAT-03-2015-0006

Howard, M., & Bussell, H. (2018). Habituated: A Merleau-Pontian analysis of the smartphone. *Library Trends*, *66*(3), 267-288. doi:10.1353/lib.2018.0003

Hughes, H. E. (2009). *International students using online information resources to learn.* (Doctoral dissertation). Retrieved from https://eprints.qut.edu.au/29348/

Hughes, H. (2014). Researching information experience: Methodological snapshots. In C. Bruce, K. Davis, H. Hughes, H. Partridge, & I. Stoodley (Eds.), *Information experience: approaches to theory and practice. (Library and Information Science, Volume 9*) (pp. 33-50). Bingley, UK: Emerald.

Humphreys, L., Von Pape, T., & Karnowski, V. (2013). Evolving mobile media: Uses and conceptualizations of the mobile Internet. *Journal of Computer-Mediated Communication, 18*(4): 491-507. doi:10.1111/jcc4.12019

Hur, W. M., Kim, H., & Kim, W. M. (2013). The moderating roles of gender and age in tablet computer adoption. *Cyberpsychology, Behavior, and Social Networking, 17*(1), 33-39. doi:10.1089/cyber.2012.0435

Ivanitskaya, L., O'Boyle, I, & Casey, A. M. (2006). Health information literacy and competencies of information age students: Results from the interactive online Research Readiness Self-Assessment (RRSA). *Journal of Medical Internet Research, 8*(2), e6. doi:10.2196/jmir.8.2.e6

James, D. (2012). *Problematic use of mobile phones: Measuring the behaviour, its motivational mechanism, and negative consequences.* (Doctoral dissertation). Retrieved from https://eprints.qut.edu.au/54749/

Johnson, J. D., Andrews, J. E., & Allard, S. (2001). A model for understanding and affecting cancer genetics information seeking. *Library & Information Science Research, 23*(4), 335–349. doi:1016/S0740-8188(01)00094-9

Johnston, B., & Webber, S. (2003). Information literacy in higher education: A review and case study. *Studies in Higher Education, 28*(3), 335-352. Retrieved from http://www.tandf.co.uk/journals/carfax/03075079.html

Johnston, N. (2014). *Understanding the information literacy experiences of EFL (English as a Foreign Language) students.* (Doctoral dissertation). Retrieved from https://eprints.qut.edu.au/71386/

Kassab, D., & Yuan, X. (2013). Understanding the information needs and search behaviour of mobile users. *Information Research, 17(*4). Retrieved from http://informationr.net/ir/17-4/paper551.html#.XJ_4t5hKiUk

Kelly, B., Hornik, R., Romantan, A., Schwartz, J. S., Armstrong, K., DeMichele, A, ...Wong, N. (2010). Cancer information scanning and seeking in the general population. *Journal of Health Communication, 15*(7), 734-753. doi:10.1080/10810730.2010.514029

Klasnja, P. V., & Pratt, W. (2012). Healthcare in the pocket: Mapping the space of mobile-phone health interventions. *Journal of Biomedical Informatics, 45*(1), 184-198. doi:10.1016/j.jbi.2011.08.017

Kratzke, C., & Cox, C. (2012). Smartphone technology and apps: Rapidly changing health promotion. *International Electronic Journal of Health Education, 15*(1), 72-82. Retrieved from http://www.aahperd.org/aahe/publications/iejhe/upload/Smartphones.pdf

Kratzke, C., Wilson, S., & Vilchis, H. (2013). Reaching rural women: Breast cancer prevention information seeking behaviors and interest in Internet, cell phone, and text use. *Journal of Community Health, 38*(1), 54-61. doi:10.1007/s10900-012-9579-3

Kuhlthau, C. C. (1993). *Seeking meaning: A process approach to library and information services*. Norwood, NJ: Ablex.

Kuhlthau, C. C. (1998). Longitudinal case studies of the information search process of users in libraries. *Library and Information Science Research, 10*(3), 257-304.

Kuhlthau, C. C. (2004). Seeking meaning: A process approach to library and information services. Westport, CT: Libraries Unlimited.

Kwon, N., Kim, D. J., Cho, H., & Yang, S. (2013). The smartphone addiction scale: Development and validation of a short version for adolescents. *PLoS ONE, 8*(12), e83558. doi:10.1371/journal.pone.0083558

Lakshminarayanan (2010). *Towards developing an integrated model of information behaviour.* (Doctoral dissertation). Retrieved from https://eprints.qut.edu.au/33252/

Lambert, S. D., & Loiselle, C. G. (2007). Health information-seeking behavior. *Qualitative Health Research, 17*(8),1006-1019. doi:10.1177/1049732307305199

Lambert, S. D., Loiselle, C. G., & Macdonald, M. E. (2009). An in-depth exploration of information-seeking behavior among individuals with cancer: part 1: Understanding differential patterns of active information seeking. *Cancer Nursing, 32*(1), 11-23. doi:10.1097/01.NCC.0000343372.24517.bd

Latham, K. F., Gorichanaz, T., & Narayan, B. (2017). Encountering the muse: An exploration of the relationship between inspiration and information in the museum context. *Journal of Librarianship and Information Science*, 1-10. doi:10.1177/0961000618769976

Lave, J., & Wenger, E. (1991). *Situated learning: Legitmate peripheral participation.* Cambridge, UK: Cambridge University Press.

Lerouge, C., & Wickramasinghe, N. (2013). A review of user-centered design for diabetes-related consumer health information technologies. *Journal of Diabetes Science and Technology*, *7*(4), 1039-1056.

Lim, S., Xue, L., Yen, C. C., Chang, L., Chan, H. C., Tai, B. C., Duh, H. B. L., & Choolani, M. (2011). A study on Singaporean women's acceptance of using mobile phones to seek health information. *International Journal of Medical Informatics, 80*(12), e189-e202. doi:10.1016/j.ijmedinf.2011.08.007

Limberg, L. (2000). Phenomenography: A relational approach to research on information needs, seeking and use. *New Review of Information Behaviour Research, 1*, 51-67.

Limberg, L., Sundin, O., & Talja, S. (2012). Three theoretical perspectives on information literacy. *Human IT, 11*(2), 93-130.

Lin, Y. H., Chang, L. R., Lee, Y. H., Tseng, H. W., Kuo, T. B. J., & Chen, S. H. (2014). Development and validation of the smartphone addiction inventory (SPAI). *PLoS ONE, 8*(12), e98312. doi:10.1371/journal.pone.0098312

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage.

Ling, R. (2014). From ubicomp to ubiex(pectations). *Telematics and Informatics, 31*, 173-183. doi:10.1016/j.tele.2013.09.001

Lloyd, A. (2006). Information literacy landscapes: An emerging picture. *Journal of Documentation*, 62(5), 570-583. doi:10.1108/00220410610688723

Lloyd, A. (2007). Learning to put out the red stuff: Becoming information literate through discursive practice. *The Library Quarterly, 77*(2), 181-198. Retrieved from http://www.press.uchicago.edu/ucp/journals/journal/lq.html.

Lloyd, A. (2009). Informing practice: Information experiences of ambulance officers in training and on-road practice. *Journal of Documentation*, *65*(3), 396-419. doi:10.1108/00220410910952401

Lloyd, A. (2010). Lessons from the workplace: Understanding information literacy as practice. In A. Lloyd, & S. Talja (Eds.), *Practising information literacy: Bringing theories of learning, practice and information literacy together* (pp. 29-46). Wagga Wagga, Australia: Charles Sturt University.

Lloyd, A. (2014). Building information resilience: How do resettling refugees connect with health information in regional landscapes – implications for health literacy. *Australian Academic and Research Libraries, 45*(1), 48-66. doi:10.1080/00048623.2014.884916

Lloyd, A., & Williamson, K. (2008). Towards an understanding of information literacy in context: Implications for research. *Journal of Librarianship and Information Science, 40*(1), 3-12. doi:10.1177/0961000607086616

Lloyd, A., Kennan, M. A., Thompson, K. M., & Qayyum, A. (2013). Connecting with new information landscapes: information literacy practices of refugees. *Journal of Documentation, 69*(1), 121-144. doi:10.1108/00220411311295351

Locke, K. (2003). *Grounded theory in management research*. London, UK: Sage Publications. doi:10.4135/9780857024428

Lundh, A. H., & Lindberg, J. (2012). Information literacies: Concepts, contexts and cultural tools. *Human IT, 11*(2), 155-164. Retrieved from http://etjanst.hb.se/bhs/ith/2-11/ahljl.pdf

Luppicini, R., & Aceti, V. (2011). Exploring the effect of mHealth technologies on communication and information sharing in a pediatric critical care unit: A case study. *International Journal of Healthcare Information Systems and Informatics, 6*(3), 1-19. doi:10.4018/jhisi.2011070101

Lupton, D. (2016). *The quantified self: A sociology of self-tracking.* Malden, MA: Polity.

Lupton, M. (2008). *Information literacy and learning*. Adelaide, Australia: Auslib Press.

Lupton, M. (2014). Creating and expressing: Information as-it-is-experienced. In C. Bruce, K. Davis, H. Hughes, H. Partridge, & I, Stoodley (Eds.), *Information experience: Contemporary Perspectives* (pp. 69-84). Bingley, UK: Emerald.

Luxton, D. D., McCann, R. A., Bush, N. E., Mishkind, M. C., & Reger, G. M. (2011). mHealth for mental health: Integrating smartphone technology in behavioral healthcare. *Professional Psychology: Research and Practice, 42*(6), 505-512. doi:10.1037/a0024485

Mackert, M., Love, B., & Whitten, P. (2009). Patient education on mobile devices: An e-health intervention for low health literate audiences. *Journal of Information Science, 35*(1), 82-93. doi:10.1177/0165551508092258

Mackey, T., & Jacobson, T. (2011). Reframing information literacy as a metaliteracy. *College and Research Libraries, 72*(1), 62-78, Retrieved from http://crl.acrl.org/content/72/1/62.full.pdf+html

Manafo, E., & Wong, S. (2012). Exploring older adults' health information seeking behaviors. *Journal of Nutrition Education and Behavior, 44*(1), 85-89. doi:10.1016/j.jneb.2011.05.018

Manierre, M. J. (2015). Gaps in knowledge: Tracking and explaining gender difference in health information seeking. *Social Science & Medicine, 128*, 151-158. doi:10.1016/j.socscimed.2015.01.028

Mansourian, Y. (2006). Adoption of grounded theory in LIS research. *New Library World, 107*(1228/1229), 386-402. doi:10.1108/03074800610702589

Marshall, A., Henwood, F., Carlin, L., Guy, E. S., Sinozic, T., & Smith, H. (2009). Information to fight the flab: Findings from the Net.Weight study. *Journal of Information Literacy, 3*(2), 50-63. doi:10.11645/3.2.218

Marton, F. (1981). Phenomenography: Describing conceptions of the world around us. *Instructional Science, 10*, 177–200. doi:10.1007/BF00132516

McCann, T. V., & Clark, E. (2003). Grounded theory in nursing research: Part 1 - Methodology. *Nurse Researcher, 11*(2), 7-18.

Medical Library Association (MLA). (2003). *Health Information Literacy: Definitions*. Retrieved from http://www.mlanet.org/resources/healthlit/define.html

Mellon, C. A. (1986). Library anxiety: A grounded theory and its development. *College & Research Libraries, 47*(2), 160-165.

Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation* (3rd ed.). San Francisco, CA: Jossey-Bass.

Miller, F. Q. (2014). *Knowledge ecosystems of early career academics: A grounded theory of experiencing information use for learning in developmental networks.* (Doctoral dissertation). Retrieved from https://eprints.qut.edu.au/71395/

Miller, F., Davis, K., & Partridge, H. (2019). Everyday life information experiences in Twitter: A grounded theory. *Information Research, 24*(2), paper 824. Retrieved from http://www.informationr.net/ir/24-2/paper824.html

Mills, J., Bonner, A., & Francis, K. (2006a). Adopting a constructivist approach to grounded theory: Implications for research design. *International Journal of Nursing Practice, 12*(1), 8-13. doi:10.1111/j.1440-172X.2006.00543.x

Mills, J., Bonner, A., & Francis, K. (2006b). The development of constructivist grounded theory. *International Journal of Qualitative Methods, 5*(1), 25-35. Retrieved from http://ejournals.library.ualberta.ca/index.php/IJQM/.

Mirza, F., Norris, T., & Stockdale, R. (2008). Mobile technologies and the holistic management of chronic diseases. *Health Informatics Journal,14*(4), 309-21. doi: 10.1177/1460458208096559

Morse, J. M. (2007). Sampling in grounded theory. In A. Bryant, & K. Charmaz (Eds.), *The SAGE handbook of grounded theory* (pp. 229-244). London, UK: Sage.

Morse, J. M. (2008). Confusing categories and themes. *Qualitative Health Research, 18*(6), 727-728. doi: 10.1177/1049732308314930

Mosnaim, G. S., Powell, L. H., & Rathkopf, M. (2012). A review of published studies using interactive internet tools or mobile devices to improve asthma knowledge or health outcomes. *Pediatric Allergy, Immunology, and Pulmonology, 25*(2), 55-63. doi:10.1089/ped.2011.0112

Mottram, A. (2011). Like a trip to McDonald's: A grounded theory study of patient experiences of day surgery. *International Journal of Nursing Studies, 48*(2), 165-174. doi:10.1016/j.ijnurstu.2010.07.007

Mulatiningsih, B. (2017). *#networkedLISprofessionals: Library and information science professionals' experience of social media.* (Doctoral dissertation). Retrieved from https://eprints.qut.edu.au/112768/

Murphy, J. (2010). Using mobile devices for research: Smartphones, databases, and libraries. *Online 34*(3), 14-18.

Myrick, J. G., & Willoughby, J. F. (2017). Educated but anxious: How emotional states and education levels combine to influence online health information seeking. *Health Informatics Journal*. doi: 10.1177/1460458217719561

Myrick, J. G., & Willoughby, J. F., & Verghese, R. S. (2016). How and why young adults do and do not search for health information: Cognitive and affective factors. *Health Education Journal, 75*(2), 208-219. doi:10.1177/0017896915571764

Narayan, B. (2014). Information organising behaviours in everyday life. In J. T. Du, Q. Zhu, & A. Koronios (Eds.), *Library and Information science Research in Asia-Oceania: Theory and Practice* (pp. 24-44). Hershey, PA: IGI Global.

Nguyen, L. C. (2014). *A participatory library model for university libraries*. (Doctoral dissertation). Retrieved from https://eprints.qut.edu.au/76288/

Niemelä, R., Ek, S., Eriksson-Backa, K., & Huotari, M. L. (2012). A screening tool for assessing everyday health information literacy. *Libri, 62*(2), 125-134. doi:10.1177/1460458212445797

Nölke, L., Mensing, M., Krämer, A., & Hornberg, C. (2015). Sociodemographic and health-(care-)related characteristics of online health information seekers: A cross-sectional German study. *BMC Public Health, 15*(1). doi:10.1186/s12889-015-1423-0.

Oh, K. M., Zhou, Q., Kreps, G., & Kim, W. (2014). The influences of immigration on health information seeking behaviors among Korean Americans and native Koreans. *Health Education & Behavior, 41*(2), 173-185.

Oh, Y. S., Choi, E. Y., & Kim, Y. S. (2018). Predictors of smartphone uses for health information seeking in the Korean elderly. *Social Work in Public Health, 33*(1), 43–54. doi:10.1080/19371918.2017.1391150

Olsson, M. (2016). Making sense of the past: The embodied information practices of field archaeologists. *Journal of Information Science, 42*(3), 410-419. doi:10.1177/0165551515621839

Pace, S. (2004). A grounded theory of the flow experiences of web users. *International Journal of Human-Computer Studies, 60*(3), 327-363. doi:10.1016/j.ijhcs.2003.08.005

Pandey, A., Hasan, S., Dubey, D., & Sarangi, S. (2013). Smartphone apps as a source of cancer information: Changing trends in health information-seeking behaviour. *Journal of Cancer Education, 28*(1), 138-142. doi:10.1007/s13187-012-0446-9

Parry, D. (2011). Mobile perspectives: On teaching mobile literacy. *Educause Review, 46*(2), 14-18. Retrieved from http://www.educause.edu/ero/article/mobile-perspectives-teaching-mobile-literacy

Partridge, H., McAllister, L., Toohey, L., Field, R., Crowe, J., & Allcock, A. (2018). Understanding information experiences of parents involved in negotiating post-separation parenting arrangements. *Journal of Librarianship and Information Science*. doi:10.1177/0961000618787604

Partridge, H., & Yates, C. (2014). Researching information experience: Object and domain. In C. Bruce, K. Davis, H. Hughes, H. Partridge, & I. Stoodley (Eds.), *Information experience: Approaches to theory and practice* (pp. 19-32). Bingley, UK: Emerald.

Piper, A. M., Garcia, R. C., & Brewer, R. N. (2016). Understanding the challenges and opportunities of smart mobile devices among the oldest old. *International Journal of Mobile Human Computer Interaction, 8*(2), 83-98. doi:10.4018/IJMHCI.2016040105

Pozzebon, M., Petrini, M., Bandeira de Mello, R., & Garreau, L. (2011). Unpacking researchers' creativity and imagination in grounded theorizing: An exemplar from IS research. *Information and Organization, 21*(4), 177-193. doi:10.1016/j.infoandorg.2011.09.001

PWC. (2012). *Emerging mHealth: Paths for Growth*. PricewaterhouseCoopers LLP. Retrieved from http://mhealthinsight.com/2012/06/09/pwc-report-emerging-mhealth-paths-for-growth/

Ravn Jakobsen, P., Hermann, A. P., Sondergaard, J., Wiil, U. K., & Clemensen, J. (2018). Help at hand: Women's experiences of using a mobile health application upon diagnosis of asymptomatic osteoporosis. *SAGE Open Medicine, 6*, 1-11. doi:10.1177/2050312118807617

Rees, C. E., & Bath, P. A. (2001). Information-seeking behaviors of women with breast cancer. *Oncology Nursing Forum, 28*(5), 899-907. Retrieved from http://www.ons.org/Publications/ONF/

Rennis, L., McNamara, G., Seidel, E. & Shneyderman, Y. (2015). Google it!: Urban community college students' use of the internet to obtain self-care and personal health information. *College Student Journal, 49*(3), 414-426.

Rosser, B., & Eccleston, C. (2011). The current state of healthcare apps for pain: A review of the functionality and validity of commercially available pain-related smartphone applications. *The Journal of Pain, 12*(4, Supplement), 9. doi:10.1016/j.jpain.2011.02.034

Sadasivam, R. S., Kinney, R. L., Lemon, S. C., Shimada, S. L., Allison, J. J., & Houston, T. K. (2013). Internet health information seeking is a team sport: Analysis of the Pew Internet Survey. *International Journal of Medical Informatics, 82*(3), 193-200. doi: 10.1016/j.ijmedinf.2012.09.008

Sairanen, A., & Savolainen, R. (2010). Avoiding health information in the context of uncertainty management. *Information Research, 15*(4). Retrieved from http://informationr.net/ir/15-4/paper443.html

Saldaña, J. (2009). *The coding manual for qualitative researchers*. London, UK: Sage.

Sandberg, J. (2005). How do we justify knowledge produced within interpretive approaches? *Organizational Research Methods, 8*(1), 41-68. doi:10.1177/1094428104272000

Savolainen, R. (1995). Everyday life information seeking: Approaching information seeking in the context of "way of life". *Library & Information Science Research, 17*(3), 259-294. doi:10.1016/0740-8188(95)90048-9

Savolainen, R. (2007). Information behavior and information practice: Reviewing the "umbrella concepts" of information-seeking studies. *The Library Quarterly, 77*(2), 109-132. doi:10.1086/517840

Sayyad Abdi, E., Partridge, H., & Bruce, C. (2013). Website designers: How do they experience information literacy? *The Australian Library Journal, 62*(1), 40-52. doi: 10.1080/00049670.2013.771767

Schensul, J. (2008). Methodology in L. Given (Ed), *The Sage encyclopedia of qualitative research methods* (pp. 517-522). Thousand Oaks, CA: Sage. doi:10.4135/9781412963909.n267

Seldén, L. (2005). On grounded theory – with some malice. *Journal of Documentation, 61*(1), 114-129. doi:10.1108/00220410510578041

Shankar, S., O'Brien, H. L, & Absar, R. (2018). Rhythms of everyday life in mobile information seeking. *Library Trends, 66*(4). doi:10.1353/lib.2018.0016

Short, M. N., & Uzochukwu, C. (2018). Mobile technology integration and student learning outcomes. In J. Keengwe (Ed.), *Handbook of Research on Mobile Technology, Constructivism, and Meaningful Learning* (pp. 178-196). Hershey, PA: IGI Global,

Smeaton, K., Bruce, C. S., Hughes, H., & Davis, K. (2017). The online life of individuals experiencing socioeconomic disadvantage: How do they experience information? *Information Research, 22*(3), paper 768.

Society of College, National and University Libraries (SCONUL). (1999). *The SCONUL seven pillars of information literacy: Core model*. Retrieved from www.sconul.ac.uk/sites/default/files/documents/coremodel.pdf

Stragier, J., Vanden Abeele, M., & De Marez, L. (2018). Recreational athletes' running motivations as predictors of their use of online fitness community features. *Behaviour & Information Technology, 37*(8), 815-827. doi:10.1080/0144929X.2018.1484516

Stavri, P. Z. (2001). Personal health information-seeking: A qualitative review of the literature. *Studies in Health Technology and Informatics, 84*(pt. 2), 1484-1488.

Stoodley, I., Bruce, C., Partridge, H., Edwards, S., & Cooper, H. (2014). Health information literacy and the experience of 65 to 79 year old Australians. In J. T. Du, Q. Zhu, & A, Koronios (Eds.), *Library and Information science Research in Asia-Oceania: Theory and Practice* (pp. 102-123). Hershey, PA: IGI Global.

Strauss, A. L. (1987). *Qualitative analysis for social scientists*. Cambridge, UK: Cambridge University Press.

Strauss, A. L., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, CA: Sage.

Sundin, O., Haider, J., Andersson, C., Carlsson, H., & Kjellberg, S. (2016). The search-ification of everyday life and the mundane-ification of search. *Journal of Documentation, 73*(2), 224-243. doi:10.1108/JD-06-2016-0081

Sundin, O., Limberg, L., & Lundh, A. (2008). Constructing librarians' information literacy expertise in the domain of nursing. *Journal of Librarianship and Information Science, 40*(1), 21-30. doi:10.1177/0961000607086618

Sunyaev, A., Dehling, T., Taylor, P., & Mandl, K. D. (2014). Availability and quality of mobile health app privacy policies. *Journal of the American Medical Informatics Association, 22*, e28-33. doi:10.1136/amiajnl-2013-002605

Suziedelyte, A. (2012). How does searching for health information on the internet affect individuals' demand for health care services? *Social Science & Medicine*, *75*, 1828-1835. doi:10.1016/j.socscimed.2012.07.022

Talip, B. A. (2016). *IT professionals' use of microblogs: A study of their information behaviours and information experience on Twitter.* (Doctoral dissertation). Retrieved from https://eprints.qut.edu.au/98963/

Thomas, G., & James, D. (2006). Reinventing grounded theory: Some questions about theory, ground and discovery. *British Educational Research Journal 32*(6), 767-795. doi:10.1080/01411920600989412

Traxler, J. (2016). Inclusion in an age of mobility. *Research in Learning Technology, 24*. doi:10.3402/rlt.v24.31372

Tucker, W. T. (1965). Max Weber's "Verstehen". *The Sociological Quarterly, 6*(2), 157-165. Retrieved from https://www-jstor-org.ezp01.library.qut.edu.au/stable/4105245

Urquhart, C., Lehmann, H., & Myers, M. D. (2010). Putting the 'theory' back into grounded theory: Guidelines for grounded theory studies in information systems. *Information Systems Journal 20*(4), 357-381. doi:10.1111/j.1365-2575.2009.00328.x

Vacaru, M. A., Shepherd, R. M., & Sheridan, J. (2014). New Zealand youth and their relationships with mobile phone technology. *International Journal of Mental Health Addiction, 12*(5), 572-584. doi:10.1007/s11469-014-9488-z

Van Manen, M. (1990). *Researching lived experience: Human science for an action sensitive pedagogy*. Albany, NY: State University of New York Press.

Vann-Ward, T., Morse, J. M., & Charmaz, K. (2017). Preserving self: Theorizing the social and psychological processes of living with Parkinson disease. *Qualitative Health Research, 27*(7), 964-982. doi:10.1177/1049732317707494

Vorderer, P., Krömer, N., & Schneider, F. M. (2016). Permanently online – Permanently connected: Explorations into university students' use of social media and mobile smart devices. *Computers in Human Behavior, 63*, 694-703. doi:10.1016/j.chb.2016.05.085

Vygotsky, L. S. (1978). *Mind in Society*. Cambridge, MA: Harvard University Press.

Vygotsky, L. S. (1986). *Thought and language*. Cambridge, MA: The MIT Press.

Walker, C. (2012). The information world of parents: A Study of the use and understanding of information by parents of young children. *Library Trends 60*(3), 546-568. doi:10.1353/lib.2012.0000

Walsh, A. (2012). Mobile information literacy: A preliminary outline of information behaviour in a mobile environment. *Journal of Information Literacy, 6*(2), 56-69. Retrieved from http://ojs.lboro.ac.uk/ojs/index.php/JIL

Wang, S. Y. (2007). *Taiwanese people with cancer and non Western medicine (NWM) use: A grounded theory study.* (Doctoral dissertation). Retrieved from https://eprints.qut.edu.au/16473/

Wang, X. (2010). *Integrating information literacy into higher education curricula An IL curricular integration model.* (Doctoral dissertation). Retrieved from https://eprints.qut.edu.au/41747/

Williamson, K. (2010). Knowledge building by Australian online investors: The role of information literacy. In A. Lloyd, & S. Talja (Eds.), *Practising information literacy: Bringing theories of learning, practice and information literacy together* (pp. 29-46). Wagga Wagga, Australia: Charles Sturt University.

Wilson, T. D. (2000). Human information behaviour. *Informing Science 3*(2), Retrieved from https://www.researchgate.net/profile/Tom_Wilson25/publication/270960171_Human_Information_Behavior/links/57d32fe508ae601b39a42875/Human-Information-Behavior.pdf

Wilson, T. D. (2006). Revisiting user studies and information needs. *Journal of Documentation 62*(6), 680-684. doi:10.1108/00220410610714912

World Health Organization (WHO). (1946). *Preamble to the Constitution of the World Health Organization.* Retrieved from http:www.who.int/governance/eb/who_constitution_en.pdf

Wu, T. T. (2014). Using smart mobile devices in social-network-based health education practice: A learning behavior analysis. *Nurse Education Today, 34*(6), 958-963. doi:10.1016/j.nedt.2014.01.013

Yates, C. L. (2013). *Informed for health: Exploring variation in ways of experiencing health information literacy.* (Doctoral dissertation). Retrieved from https://eprints.qut.edu.au/65354/

Yates, C., & Partridge, H. (2014). Exploring information literacy during a natural disaster: The 2011 Brisbane flood. In C. Bruce, K. Davis, H. Hughes, H. Partridge, & I. Stoodley (Eds.) *Information experience: Approaches to theory and* practice (pp. 119-134). Bingley, UK: Emerald Group.

Yates, C., & Partridge, H. (2015). Citizens and social media in times of natural disasters: Exploring information experience. *Information Research, 20*(1). Retrieved from http://www.informationr.net/ir/20-1/paper659.html

Yates, C., Partridge, H., & Bruce, C. (2009). Learning wellness: How ageing Australians experience health information literacy. *The Australian Library Journal, 58*(3), 269-285. Retrieved from http://www.alia.org.au/publishing/alj/58/ALJ_Aug2009_Vol58_N3_web.pdf

Yates, C., Partridge, H., & Bruce, C. (2012). Exploring information experiences through phenomenography. *Library and Information Research, 136*(112), 96-119. Retrieved from http://www.lirgjournal.org.uk/lir/ojs/index.php/lir

Yates, C., Stoodley, I. D., Partridge, H., Bruce, C., Cooper, H., Day, G., & Edwards, S. (2012). Exploring health information use by older Australians within everyday life. *Library Trends, 60*(3), 460-478. Retrieved from http://www.press.jhu.edu/journals/library_trends/

Yurkiewicz, I. R., Simon, P., Liedtke, M., Dahl, G., & Dunn, T. (2018). Effect of FitBit and iPad wearable technology in health-related quality of life in adolescent and young adult cancer patients. *Journal of Adolescent and Young Adult Oncology, 7*(5), 579-583. doi:10.1089/jayao.2018.0022

Zionts, N. D., Apter, J., Kuchta, J., & Greenhouse, P. K. (2010). Promoting consumer health literacy: Creation of a health information librarian fellowship. *Reference & User Services Quarterly, 49*(4), 350–359.

APPENDICES

Appendix A: Pilot study reflections

Pilot interview reflections

Many of the interview reflections in this section were drawn from my memos. Reflections or memos of each pilot interview were written and stored as separate files on my tablet computer named by date of file creation and a suitable name. Memos also included reflections before and after interview and thoughts about the pilot study in general.

Pilot participants

	Participant	Device/s	Age	Gender	Occupation	Highest level of education
Phase 1	Participant 1	smartphone; laptop	35	female	Teaching assistant (primary school)	Certificate of Library Information & Cultural Services
	Participant 2	smartphone; laptop	33	female	Radiation therapist	Bachelor degree
Phase 2	Participant 3	smartphone; tablet computer; laptop; e-reader	36	female	Project and account manager	Master of IT
	Participant 4	smartphone; tablet computer	42	male	Commercial airline pilot	Bachelor degree

The pilot study confirmed that face-to-face interviews allow ease of conversation. All interviews were conducted in a semi-structured, informal way – a focused chat over morning tea or lunch. Comfortable venues and food were conducive to relaxed conversation. Ideally, future interviews will also be conducted in relaxed and mutually convenient settings.

Existing contacts, existing rapport

The relative comfort was partly attributable to the rapport that already existed between researcher and each participant. Similarly, Gunton et al. (2012, p. 122) state in their study of information literacy in church communities that "because the interviewer was known to the participants and is involved in the community, she enjoyed the confidence of participants".

Recruiting from existing contacts presents clear advantages. For example, confidence and rapport. Charmaz (2006, p. 110) explains that "we gain access through the trust that emerges through establishing on-going relationships and reciprocities".

In this pilot study, a real life or natural social network provides a good cross-section of society in terms of age and occupation. The trade-off is that the participants may be too familiar with the study. To counter this, I excluded people familiar with information research. Also, the researcher may be too close to the participants and may have preconceived ideas. However, as mentioned previously, Glaser (2009) states that novice grounded theorists have the advantage of being open to emergent ideas and theories.

Shared experience

I conversed enthusiastically with my participants because of existing rapport and shared experience. We know each other even if we are only casual acquaintances. My tablet and smartphone are on the table audio recording the interview. Dee (Participant 3) helped me figure out the finer workings of the audio recording app on my tablet. Before audio recording started, Richard (Participant 4) commented on the army camouflage cover on my tablet and I said it was used in the military and supposedly childproof too. He showed me how his tablet fits into the keyboard dock and how it can be placed in landscape or portrait position.

I did not mention my health experiences with my participants but would do so if prompted. As I sat with each of my participants to chat, I was aware that we already had existing rapport and personal devices on the table to compare. It was a shared experience in which my participants are the main characters. Charmaz (2006, p. 130) confirms that a constructivist approach sees both data and analysis as created from the shared experiences and relationships with the participants.

Probing experience rather than condition

There were many opportunities to probe but this was balanced with following the participant's train of thought and allowing them to tell their story. The interview or "directed conversation" according to Loftland and Loftland (cited in Charmaz, 1990, p. 1167), is a co-construction and a balancing act. It was a fine line between directing and leading. I was careful about probing participants' personal health issues.

Firstly, I sought a relatively private yet safe place for the interview. Secondly, if a participant discussed sensitive or uncomfortable health issues, I tried to focus on health information experience rather than the condition *per se*. For example, Dee (Participant 3) spoke with

trepidation of her colleague's self-medication of a skin lesion on his arm which prompted her to watch YouTube videos about "the black salve" on her iPad later. The conversation was directed towards her information experiences rather than the actual skin lesion (even though it was a curiosity and an impressionable part of her experience).

Post-interview follow-up

Participant experiences can be intriguing and, fortunately, grounded theorists can ask follow up questions and conduct subsequent interviews if appropriate. Not every interesting point can be probed at the interview and, often, more questions arise after the interview during transcription and data analysis. In other words, it is impossible to recognise the significance of every point during the interview. For example, after the interview with Nikita (Participant 1), I realised that she felt strongly about not using a prescribed cortisone cream on her baby, but I did not ask why. So, I asked her in a text message and she replied via text message that it was because it was not a "natural product", so she did not trust it. I also asked her why she didn't use Facebook and Twitter. She said that it was because she found it "impersonal" and that people tend to "rabbit on".

Audio recordings using mobile devices

In the area of mobile learning, Beddall-Hill, Jabbar and Al Shehri (2011) found that iPhones and iPads are efficient tools for qualitative inquiry. Researchers and participants can use various functions such as voice memos and the GPS and camera functions to collect data in the field.

However, they caution that the iPhone is not yet considered a serious research tool because it is primarily used as a social tool. They state that it is imperative to build trust from the outset and "the researcher should make clear that the device is being used for recording and not transmitting" (Beddall-Hill et al., 2011, p. 78).

In the pilot study, participants were unconcerned that I was using my mobile devices to audio record. However, in the main study, I will endeavour to continue building trust. As aforementioned, my participants warmed to the fact that I was using my smartphone and tablet and they contributed to a shared experience.

The pilot study did highlight that noise can be a technical issue. My audio recorders (on my smartphone *Voice Memos* app and tablet computer *Recorder Plus* app) are sensitive and pick up background noise. I borrowed an mp3 audio recorder for the first interview, but the sound quality was no better than the mobile device audio recordings. A combination of convenience

and adequate sound quality mean that mobile devices are suitable for recording future interviews. I have retained the audio recordings for future reference during data analysis. They will be handled in accordance with QUT Ethics.

Interview transcriptions and pseudonyms

Interviews were transcribed verbatim. Transcription prompted further reflection about the interview process and content which were subsequently recorded in memos. Although time consuming, this promoted intimacy with the data – which is an integral part of the iterative nature of grounded theory.

I plan to use personal pseudonyms for each participant because, from a constructivist point of view, my participants are partners. Harlan (2012, p. 28) used pseudonyms that were often selected by her teen participants while Hughes (2009, p. 131) used pseudonyms to convey the individuality of her students and protect their identities.

Strategies for the main study

The pilot study's two phases were highly valuable for testing and fine-tuning the research instrument and data collection process. The pilot participants were "excellent" (Morse, 2007) and varied. Although coding and data analysis has not started, interesting initial observations can be made from the pilot study. The interviews produced rich data and this richness is further testimony to the quality and success of the interview questions and data collection process.

As a result, the revised primary interview question will remain unchanged as the term "health things" is considered more open-ended than the phrase "to be healthy" used in Phase 1 of the pilot study. I will continue to ensure that participants are suitably oriented toward the study pre-interview and continue to develop my probing skills.

I will try not to schedule more than one interview per day because they require intense concentration and can be exhausting.

A mobile in hand

A mobile device in a participant's hand can stimulate reflection and conversation. Participants can demonstrate how they use it so, in future, I will ensure they have Internet access at the interview. This may include planning the interview at a location with Wi-Fi access. On occasion it is important to specify on the audio recording which device the participant is referring to if they use more than one device. For example, they may be holding

the device in their hand during the interview, but it may be difficult to discern which device they are referring to on the transcript without visual cues.

Conversation before and after interviews

Conversation before audio recording is also important because participants can be more candid without the pressure and formality of the audio recorded interview. For example, Nikita (Participant 1) said she loved her phone before recording started and Richard (Participant 4) said he loved his iPad pre-interview.

In the main study I will continue to provide an opportunity for participants to ask questions towards the end of the interview and post-interview via text message, e-mail or in-person. Keeping channels of communication open is important because both researcher and participant may have further questions and ideas later.

Appendix B: Developing the research instrument

This section discusses the development of the research instrument in a pilot study that consisted of two phases. The purpose of pilot study was to test and fine-tune the research instrument and other interview questions as well as to refine my technique as an interviewer. I conducted Phase 1 of the pilot study in February and March 2014 and included Nikita (Participant 1) and Ella (Participant 2) in sequential interviews. Phase 2 of the pilot study occurred during July 2014 and included Dee (Participant 3) and Richard (Participant 4) in sequential interviews. The final research instrument was used in the entire main study which included eight participants and continued from August 2015 to March 2016.

The research instrument used in Phase 1 of the pilot was as follows:

"Can you tell me how you use your mobile device (e.g. smartphone, computer tablet) to be healthy?"

The initial research instrument worked suitably well when interviewing the first two participants because they were part of my existing network of contacts. They were easy to brief and orient towards my study before the interviews started. After the first two interviews (Phase 1) and supervisory review, I decided to refine the research instrument to:

"Can you tell me how you use your mobile device (e.g. smartphone, tablet computer) for health things?"

The revision included changing "computer tablet" to "tablet computer" and "to be healthy" to "for health things". I decided that the revised research instrument was more open-ended which encouraged free expression. For example, the word "healthy" implies good health while "health things" intentionally implied anything related to health and wellbeing which aligned better with the broad view of health used in this study. Although "computer tablet" is not incorrect the term "tablet computer" is more commonly used which is why the term was revised.

In phase 2, the revised research instrument worked suitably well, that is, it gathered rich data which is discussed further in this chapter. Although both the initial and revised research instruments prompted participant reflection and conversation, I chose a third research instrument after panel review (at confirmation of candidature) and discussion with my supervisors. In the main study, the research instrument remained unchanged. I started each interview with the open-ended question:

“Can you tell me how you use your mobile device (e.g. smartphone, computer tablet) for health and wellness?”

The following table outlines the research instrument revisions which includes the single-question research instrument used in Phase 1, the revised research instrument used in Phase 2, the final research instrument used in the main study as well as probe questions used throughout the study.

Research instrument revisions

Research instrument used in Phase 1 of the pilot study	“Can you tell me how you use your mobile device (e.g. smartphone, computer tablet) to be healthy?”
Research instrument used in Phase 2 of the pilot study	“Can you tell me how you use your mobile device (e.g. smartphone, tablet computer) for health things?”
Research instrument used in main study	“Can you tell me how you use your mobile device (e.g. smartphone, tablet computer) for health and wellness?”
General probe questions	Can you explain that further? Could you tell me more about that? What do you mean by that? Why is that important? Could you please give me an example?
Background probe questions	How do you know how to use your mobile device/s? What did you use (for health information) before you had your mobile device/s?

Appendix C: Participant information and consent form

Queensland University of Technology Brisbane Australia	PARTICIPANT INFORMATION FOR QUT RESEARCH PROJECT – Interview –
How people use mobile devices for health information QUT Ethics Approval Number 1400000018	

RESEARCH TEAM

Principal Researcher: Julie Lee PhD student

Associate Researcher: Professor Helen Partridge

Dr Kate Davis

Information Systems School, Science and Engineering Faculty, Queensland University of Technology (QUT)

Description

This project is being undertaken as part of a PhD study for Julie Lee.

The purpose of this project is to explore how people use their personal mobile devices for health information.

You are invited to participate in this project because you fit the participant profile. I am looking for people aged 18 years or older who are frequent and enthusiastic mobile device users and are able and willing to discuss how they use the mobile device/s for health information. Your input will be valuable in helping me to develop a picture of mobile health information use.

Participation

Your participation will involve some general demographic questions and an audio recorded interview at a mutually agreed location that will take approximately 30-60 minutes of your time. The following question is indicative of the interview questions:

Can you tell me how you use your mobile device (e.g. smartphone, tablet computer) for health and wellness?

Your participation in this project is entirely voluntary. If you do agree to participate you can withdraw from the project without comment or penalty. If you withdraw, on request any identifiable information already obtained from you will be destroyed. Your decision to participate or not participate will in no way impact upon your current or future relationship with QUT (for example your grades) or with associated external organisation.

Expected benefits

It is expected that this project will not benefit you directly. However, it may benefit library and information agencies, governments and other organisations involved in providing health information support to individuals and communities.

Risks

There are minimal risks associated with your participation in this project. However, it is possible that discussing personal health may cause some discomfort or distress. It is important to note that the researcher is not interested in discussing your personal health status. The focus of the research is on exploring how you use your mobile device for health information.

QUT provides for limited free psychology, family therapy or counselling services for research participants of QUT projects who may experience discomfort or distress as a result of their participation in the research. Should you wish to access this service please contact the Clinic Receptionist of the QUT Psychology and Counselling Clinic on 07 3138 0999. Please indicate to the receptionist that you are a research participant.

PRIVACY AND Confidentiality

All comments and responses will be treated confidentially unless required by law. The names of individual persons are not required in any of the responses. Any data information obtained in connection with this project that can identify you will remain confidential. We plan to publicly present and publish the results of this research; however, information will only be provided in a form that does not identify you.

Your interview will be audio recorded:

- It is not possible to participate in this research without being audio recorded.

- You will not be given the opportunity to verify your comments and responses prior to final inclusion.
- Audio recordings will be destroyed at the conclusion of the project.
- Only researchers and supervisors listed above will have access to your recorded interview.
- Audio recordings will not be used for any other purpose.
- All responses provided by participants will be made anonymous on transcription.

Please note that non-identifiable data collected in this project may be used as comparative data in future projects or stored in an open access database for secondary analysis.

Consent to Participate

We would like to ask you to sign a written consent form (enclosed) to confirm your agreement to participate.

Questions / further information about the project

If have any questions or require further information, please contact one of the research team members below.

Professor Helen Partridge

h.partridge@qut.edu.au

Julie Lee

j222.lee@student.qut.edu.au

Concerns / complaints regarding the conduct of the project

QUT is committed to research integrity and the ethical conduct of research projects. However, if you do have any concerns or complaints about the ethical conduct of the project you may contact the QUT Research Ethics Unit on 07 3138 5123 or email ethicscontact@qut.edu.au. The QUT Research Ethics Unit is not connected with the research project and can facilitate a resolution to your concern in an impartial manner.

Thank you for helping with this research project. Please keep this sheet for your information.

Queensland University of Technology Brisbane Australia	CONSENT FORM FOR QUT RESEARCH PROJECT – Interview –
How people use mobile devices for health information QUT Ethics Approval Number 1400000018	

RESEARCH TEAM CONTACTS

Professor Helen Partridge

h.partridge@qut.edu.au

Julie Lee

j222.lee@student.qut.edu.au

STATEMENT OF CONSENT

By signing below, you are indicating that you:

- Have read and understood the information document regarding this project.
- Have had any questions answered to your satisfaction.
- Understand that if you have any additional questions you can contact the research team.
- Understand that you are free to withdraw at any time, without comment or penalty.
- Understand that you can contact the Research Ethics Unit on 07 3138 5123 or email ethicscontact@qut.edu.au if you have concerns about the ethical conduct of the project.
- Understand that the project will include audio recording
- Understand that non-identifiable data collected in this project may be used as comparative data in future projects.
- Agree to participate in the project.

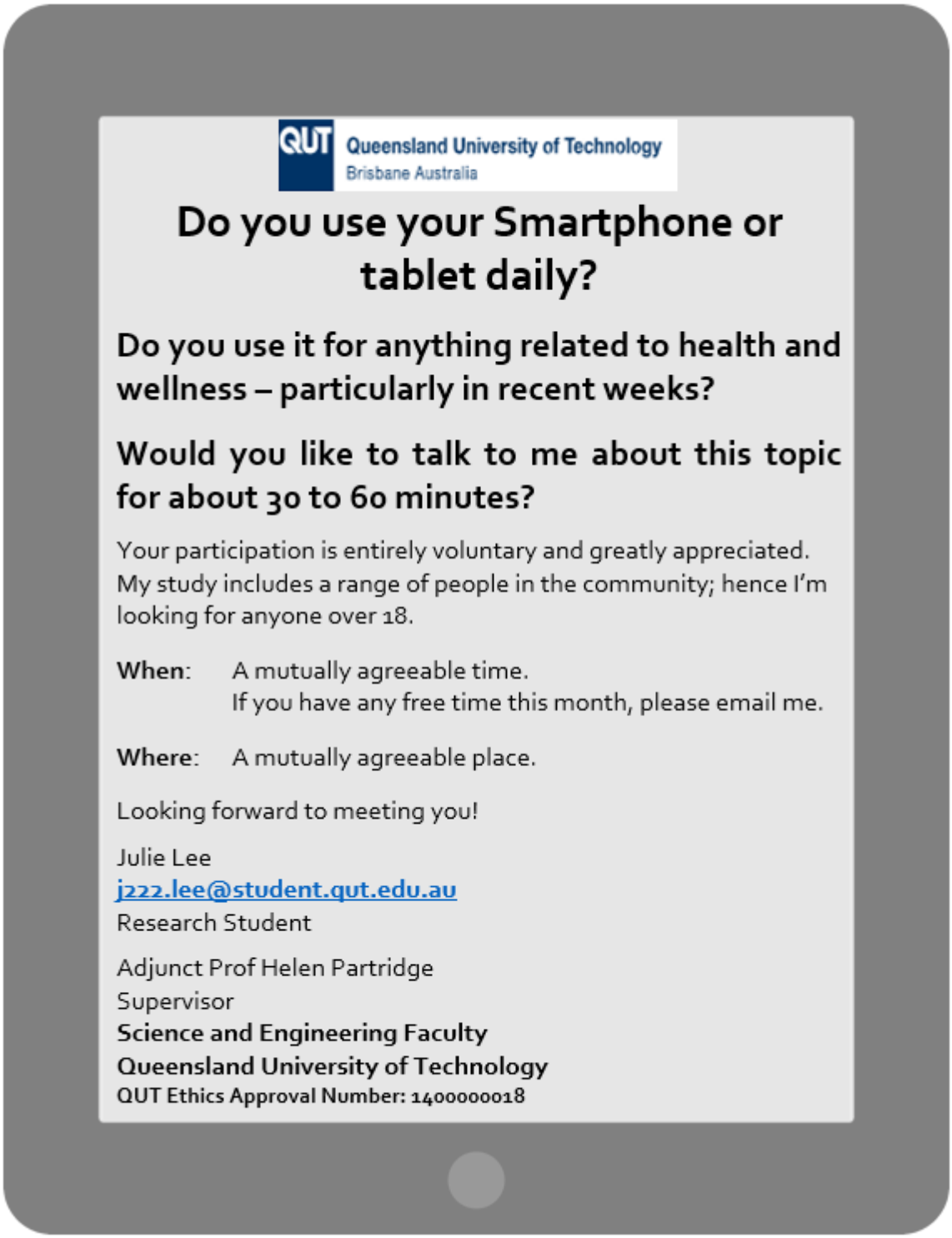
Name .....

Signature .....

Date .....

Please return this sheet to the investigator.

Appendix D: Recruitment flyer



Appendix E: Interview guide

How people use mobile devices for health information

Individual Interviews

Discussion Guide – Duration: 30 to 60 minutes

1. Introduction (3-5 mins)

    - Greeting
    - Introduction to the project overall
    - Purpose of the interview
    - Confidentiality
    - Consent process
    - Individual opinion and experience (no right or wrong answer)
    - Focus on the way people use mobile devices for health information NOT personal health status
    - Audio recorded

2. Prompt Questions: (20-50 mins)

The following questions are illustrative of the type of questions to be used during the interview. This list is not exhaustive other questions may be asked depending on the points raised by the participant. The focus is on creating a more natural free flowing dialogue or conversation with the participant and not a formal stilted interview. Every effort will be made to ask the questions in a natural and unobtrusive way. This may mean the questions are not asked in any particular order and some questions may be missed and other new questions added depending on the conversation flow. General probe questions will also be used to elicit further information from participants about the responses they provide.

Can you tell me how you use your mobile device (e.g. smartphone, tablet computer) for health and wellness? General probe questions:

- What did you think and feel about that?
- Could you explain that further?
- Could you tell me more about that?
- What do you mean by that?
- Why is that important?
- Could you please give me an example?

3. Summary (2 mins)

    - Question & Answer Time
    - Thank participant

Appendix F: Memo sample

Memo-NVivo coding stripes for multiple codes per lump

20150908

I quickly discovered that working through data line-by-line is not as simple as it sounds. Additionally, some phrases or lines require more than one code to interpret their full meaning. At this initial coding stage, I prefer using multiple codes per line to assuming one meaning. I think this is one way of remaining open to the data. It is possible that they may not stand as a focused code over time but at least they have been flagged as an initial code.

One of the creators of NVivo, Pat Bazeley (2013, p. 73) states in "Qualitative data analysis with NVivo" to "use multiple codes for the same passage of text – the computer will be able to reconstruct the links when needed". I think this is sound advice.

Lumping

Bazeley (2013, p. 143) in "Qualitative data analysis: Practical analysis" describes lumpers and splitters. I think I am a lumper. The NVivo dump below shows how coding stripes can be linked to a lump of data. So, rather than splitting the data into tiny pieces that can be meaningless in an isolated segment, I personally prefer to conceptually lump and see the multiple codes created from that lump. I can see at a glance the seven initial codes created from the highlighted text. I can see that the code "journeying to better health" has used the participant's own word "journey" because I have put "*in vivo*" in brackets after the code.

Appendix G: Participant profile questions

How people use mobile devices for health information
Interview Participant Profile

1. What is your year of birth?

2. What is your gender?

3. What is the highest level of education you have obtained?

4. Are you currently employed?

5. What is your occupation?

Participant Number: