The Effect of a Self-Development Coaching Program on the Psychological Health and the Academic Performance among Medical and Dental Students in Saudi Arabia

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Dedication

To Allah (God) and the Islamic nation,
To my father, Talal, and my mother, Zainab,
To my wife, Lubabah, and my children, Farah, Lubna, and Qusay. These have endured my hard life, and my long working days.
Acknowledgement

In the name of Allah the most Gracious, the most Merciful

I would like to gratefully thank Allah for his support and blessing to accomplish this work, and I ask him to bless me again to use the knowledge and skills he allowed me to develop to participate in the flourishing of the Islamic civilisation and to help others.

Countless thanks for my parents, Talal Aboalshamat and Zainab Khojah, who spent all of those years of raising, caring, and entrusting me. This accomplishment would not exist without the support of my wife and my children, Lubabah, Farah, Lubna and Qusay, the hidden soldiers and the white hands who endured my hard life and my long working days. I wish that I will honour them by this contribution and that they will have enduring pride in this achievement.

Moreover, I would like to thank my marvelous and supportive principal supervisor, associate professor Dr Xiang-Yu Hou for her mentoring, consistent support and patience with my fluctuating emotions during the PhD milestones. Without her efforts, I think the journey would have been far, far more difficult. Also I would like to thank my associate supervisor Dr Esben Strodl for his brilliant guidance and feedback that has helped result in this thesis. His critical feedback enabled me to craft my thesis to the edge of excellence. Moreover, I want to thank my friends, colleagues and everyone who helped me along this journey with a smile, encouragement, advice, help or even a critique.

I would like also thank the professional editor, Diane Josey, who provided copyediting and proofreading services, according to the guidelines laid out in the university-endorsed guidelines and the Australian Standards for editing research theses.

My gratitude is also extended to the Faculty of Dentistry at Umm Al-Qura University (UQUDENT), for the support they provided to me as a holder of the faculty Scholarship. This allowed me to acquire a Master of Public Health and to continue my PhD at Queensland University of Technology.
Keywords

Abstract

Background

Despite the fact that medical and dental students have been reported to have a high prevalence of poor psychological health, few studies’ using an interventional design have been used to improve the students’ psychological health. This deteriorated psychological health status has been observed in many countries, however, no study has investigated the psychological health of the students in the Holy City of Makkah, Saudi Arabia, which receives millions of Muslim pilgrims every year. It has also been noted that self-development coaching programs have recently become an increasingly popular way to increase people's psychological health status. It is an industry that is estimated to be worth many billions of dollars around the world. It is very popular and used by many people to attempt to improve their lives. However, few studies have evaluated the effectiveness of such programs with regards to improving psychological health. In particular, no studies have been conducted on self-development coaching program in Saudi Arabia.

Aim

This thesis by publication aimed to assess the psychological health among preclinical medical and dental students in Saudi Arabia. More importantly, it also aimed to evaluate the effect of a self-development coaching intervention on psychological health and the academic performance of the target population.

Methodology

The project was conducted by inviting a selective clustered purposeful sample of medical and dental students of Umm Al-Qura University (UQU), Makkah, Saudi Arabia, in the academic year of 2012–2013. The project involved two stages: 1) Observational: to evaluate the students psychological health and follow them prospectively; 2) Interventional: by conducting a pilot study and a parallel-randomised controlled trial, partially blinded, to assess the effect of a self-development coaching program on the students’ psychological health and academic performance.

The students underwent a general assessment four times:
The students were asked to answer questionnaires to measure psychological health using the Depression Anxiety Stress Scale (DASS21), the General Self-Efficacy scale (GSE), and the Satisfaction With Life Scale (SWLS). Academic performance was also measured using students’ academic weighted grades (WG). Students’ cognitive and emotional perceptions about the intervention were measured using the Credibility/Expectancy Questionnaire (CEQ). Furthermore, students assessed the coaching program and the coach characteristics (CPCC) using a set of eleven questions derived from literature.

Before conducting the RCT, a pilot study of the self-development coaching program was conducted on clinical medical students to assess the conductibility of the main trial. For the main RCT, the students in the intervention group (IG) received a self-development coaching program which aimed to improve students’ psychological health and academic performance. Conversely, the students in the control group received a placebo program. Both programs were conducted by the same coach in the first week of the second term.

The project was approved by the Chair, University Human Research Ethics Committee of Queensland University of Technology and confirmed as meeting the requirements of the National Statement on Ethical Conduct in Human Research (2007) (number 1200000411). The project was also approved by the faculties of medicine and dentistry at UQU. The RCT study was registered at the Australian New Zealand Clinical Trials Registry (number ACTRN12614000896673).

**Results**

The first assessment indicated that two thirds of the preclinical medical and dental students had depression, anxiety, and/or stress. At least one third of the overall sample were classified as having a severe condition. The students’ satisfaction with life and self-efficacy were within the normal range of similar populations. The students follow-up assessment illustrated that the levels of students’ depression, anxiety, stress, and satisfaction do change with time across the same academic year, as the students’ had better psychological measures at the beginning of a term when compared to measurements from the middle of a term. The results also showed in general that medical, female
or 3rd year students seemed to have worse psychological health than dental, male or 2nd year students.

On the other hand, the self-development coaching program in general had significant short term and long term effects on the students’ depression, anxiety, stress, and satisfaction with life. However, there was only a short term effect on depression and anxiety in comparison to the active control. No effect of the program was found on the academic performance compared to the active control.

**Conclusion**

The preclinical medical and dental students at UQU suffered from high levels of distress, higher in general, than those found among similar students in many other countries. The UQU medical and dental students required special attention from their institution’s stakeholders. Their distress seems to have fluctuated across time, which is consistent with literature. Medical, female, and 3rd year students seemed to be more vulnerable groups than others. Those subgroups should be supported with customised programs. The self-development program seems be a promising way to help the affected students as a palliative solution. Such programs can be recommended due to the feasibility of conducting these programs and the ability to include large numbers of students.


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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: Khalid Aboalshamat

Date: December 2015
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<td>Australian New Zealand Clinical Trials Registry</td>
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<td>APT</td>
<td>College Aptitude Test</td>
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<td>AU$</td>
<td>Australian Dollar</td>
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<td>CBT</td>
<td>Cognitive Behavioural Therapy</td>
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<td>Organization of the Petroleum Exporting Countries</td>
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Chapter 1. Introduction

Introduction

This thesis explores the psychological health of medical and dental students and evaluates the utilisation of a self-development coaching program to improve the students’ psychological health in the Holy City of Makkah in Saudi Arabia. Medical and dental students in many countries, including Saudi Arabia, are facing a variety of challenges such as high academic workload, competition, and long study periods that have led to poor psychological health according to the literature (Abdulghani, AlKanhal, Mahmoud, Ponnamperuma, & Alfaris, 2011; Alzahem, Van Der Molen, Alaujan, Schmidt, & Zamakhshary, 2011; Dyrbye, Thomas, & Shanafelt, 2006). According to many systematic reviews, a small number of interventional studies have been conducted around the world to investigate the students' psychological health (Alzahem, Van der Molen, Alaujan, & De Boer, 2014; Shiralkar, Harris, Eddins-Folensbee, & Coverdale, 2013; Yusoff, 2014). To date, there has been no research into the psychological health of medical and dental students in Makkah, nor assessment of any use of self-development coaching programs as an approach to alleviate medical and dental students’ psychological distress. Given the importance of the psychological health of medical and dental students and the consequences of poor psychological health, as well as the growing popularity of self-development coaching programs, this thesis focuses on exploring the prevalence of psychological health status among those students, tracking change over time, and assessing the efficacy of a self-development coaching program for them. This document is a thesis by publication that presents five scientific articles, articulating together and contributing to the scholarly research literature concerning both students’ positive and negative psychological health status, and the effectiveness of using self-development coaching programs in the Middle East.

This chapter presents a background and context for the thesis by highlighting both the medical and dental educational backgrounds, especially in Saudi Arabia, and the concept of self-development coaching programs. This chapter also delineates the theoretical framework, aims, objectives, and structure of the thesis.
Introduction to Medical and Dental Education and Saudi Arabia

There is no doubt of the fundamental role of medical doctors and dentists in the provision of health care globally. Their value has been accentuated by the sharp global shortage of, and demands on, the health workforce (Almalki, Fitzgerald, & Clark, 2011; Scheffler, Liu, Kinfu, & Dal Poz, 2008). To meet the increasing demand of growing populations, there is an expansion in medical education in many countries around the world (Goodman, 2007; Telmesani, Zaini, & Ghazi, 2011). However, this expansion faces a challenge due to the considerable percentage of dropouts among medical and dental students during their undergraduate years (Alzahem et al., 2011; Dyrbye et al., 2010), despite the efforts initially expended by students to meet the comparative and selective criteria of acceptance into medical and dental faculties (Sugiura, Shinada, & Kawaguchi, 2005; Telmesani et al., 2011).

One of the main reasons for dropping out of medical faculties is the poor psychological health of the students (Dyrbye et al., 2010). Indeed, the medical and dental educational environment is associated with chronic psychological distress such as depression, anxiety, and stress among students (Alzahem et al., 2011; Dyrbye et al., 2006). This deterioration in psychological status has been found to be associated not only with dropping out, but also with students’ academic problems and poor academic performance (Alzahem et al., 2011; Dyrbye et al., 2006). Such a deteriorating status can potentially lead to serious consequences with regard to patient safety (Dahlin & Runeson, 2007; Tyssen & Vaglum, 2002). This status has drawn the attention of many scholars who have investigated medical and dental students’ psychological health and called for interventions to manage this problem (Al-faris et al., 2012; Dyrbye et al., 2006; Niemi & Vainiomäki, 2006). That is why this thesis aims to investigate the psychological health of medical and dental students and a suggested intervention to improve the current status in the much-needed medical and dental professions.

The Saudi medical and dental students constituted the target population of this thesis as they have poor psychological health, as has been reported in some studies (Abdulghani et al., 2011; Al-Mobeeriek & Al-Mobeeriek, 2011). Saudi Arabia is the largest country among the Arabic Gulf countries, and is located in the heart of the Middle East. According to the Organization of the Petroleum Exporting Countries (OPEC), Saudi Arabia is considered as having one of the largest crude oil reserves in the world (OPEC, 2013). This explains Saudi Arabia’s position of being the country with the ninth highest Gross Domestic Product (GDP) per capita in the world (The World Bank, 2013). This is the explanation for the current massive growth in Saudi in different fields,
especially the field of medical education (Telmesani et al., 2011). In fact, there are 21 governmental and private faculties in Saudi Arabia that teach medicine (Telmesani et al., 2011) and 25 faculties that teach dentistry (Umm Al-Qura University, 2013a). Since 2006, eight medical and seventeen dental faculties have been established (Telmesani et al., 2011; Umm Al-Qura University, 2013a).

To date, there are only a limited number of studies investigating Saudi medical and dental students’ psychological health, and there has been no interventional study to improve students’ psychological health in Saudi Arabia to the author’s knowledge, which is not the case for other, non-Arabic, countries.

It should be mentioned that Arabic is the official language in Saudi Arabia, and most Saudis are Muslim. In fact, Saudi Arabia has a unique position in the Islamic world as it encloses the Holy City of Makkah that is visited by 1.9 to 3.1 million Muslim pilgrims every year at the Hajj annual event (Central Department of Statistics and Information, 2014); in addition, another 6 million pilgrims visit Makkah for Umrah ritual practice each year (Soliman, Cook, & Coker, 2015). These religious practices and events increase the burden on the national public services. This burden includes: increases in health expenditure, and services provided by the Saudi Ministry of Health (Almalki et al., 2011). The unique position of Saudi Arabia is critical when acknowledging the shortages in the Saudi health workforce and it is considered a challenge for the Saudi healthcare system (Almalki et al., 2011).

This situation underlies the author’s concern in this thesis to investigate the mental health status of medical and dental students who will constitute the future Saudi healthcare workforce. It further justifies the author’s focus on medical and dental students in Makkah, that is, on those who will most likely work on the front line with pilgrims in Makkah every year.

To ensure the readers’ understanding of this thesis, it is relevant to illustrate a number of points about medical and dental education in Saudi Arabia. Admission to medical and dental faculties in Saudi Arabia is highly competitive. High school graduates compete for a position based on a combination of high school grades, the College Aptitude Test (APT), written exams and an interview (Hamdy et al., 2010; Telmesani et al., 2011). Undergraduate medical students in almost all Saudi universities study for seven years: one orientation year, two preclinical years (2nd–3rd), and three clinical years, followed by a final internship year (Hamdy et al., 2010). This is the same for dental faculties in Saudi Arabia except that students start some dental lab sessions from the 2nd year (Umm Al-Qura University, 2013b). It should be noted that this structure is different from that in some other countries such as the United States, where medicine and dentistry are generally a four
year program after the completion of a bachelor degree. Each academic year in Saudi Arabia is composed of two terms, and there is no summer term in either faculty. The first term is 21 weeks, including two weeks for exams and three weeks for the Islamic pilgrimage (Hajj) vacation (Umm Al-Qura University, 2012). The second term is 19 weeks, including two weeks for exams and one week of mid-term vacation (Umm Al-Qura University, 2012; see Appendix A).

In Saudi Arabia, the medical and dental curricula in both medical and dental faculties are mainly traditional (lecture-based), and organised in a compulsory course structure. It should be highlighted that there has been a recent shift towards student-centred approaches to teaching and learning in the curriculum in medical faculties (Hamdy et al., 2010); however, these changes have not altered the traditional structure of the educational program. Student assessment in medical faculties involves traditional long essays, multiple choice questions (MCQ), and objective, structured clinical examination (OSCE) (Hamdy et al., 2010). Student assessment in dental faculties involves traditional long essays, multiple-choice questions (MCQ), case presentation, and clinical examinations. When the study and data collection for this thesis was undertaken, students studied between approximately 9 am and 4 pm on weekdays, which in Saudi was Saturday to Wednesday at that time, while Thursday and Friday were the formal weekend. This has been changed in all Saudi universities since September 2013 – the weekend is now Friday-Saturday, in line with the arrangements of other members of the Gulf Cooperation Council. This change occurred after the data collection period.

For religious and cultural reasons, male and female students in Saudi Arabia are totally isolated from one another during the academic year by having different classrooms, rotations, and sometimes by having different faculty staff, especially for the preclinical years. However, both genders study the same curriculum and take the same exams. Gender segregation was taken into consideration in the study design of this thesis.

**Introduction to Self-Development Materials and Coaching**

Self-development materials and coaching is a growing industry that has been estimated to be worth billions of dollars worldwide (BBC, 2009; McGee, 2005). In 2000, it was estimated that Americans spent US$563 million on buying self-development books alone (Paul, 2001), while the revenue from coaching was estimated to be US$1.5 billion dollars in 2006 (International Coach
In 2009 it was estimated by *Time Magazine* that Americans spent 10 billion dollars on self-development (Thornburg, 2011).

The above indicators of the magnitude of the self-development industry correspond with the literature on the popularity of self-development materials and coaching. A survey of 1,205 participants in Vienna revealed that half of them read self-development books and attended self-development programs to cope with psychological distress (Holzinger, Matschinger, & Angermeyer, 2012). *The New York Times* reported that *The Secret*, a 2006 book by Rhonda Byrne, which is an example of self-development book, sold 19 million copies in 40 languages around the world (Chabris & Simons, 2010). Starker found 3700 American books started with the title “How to” (Starker, 2002). “How to” books are types of self-development books.

It is suggested that coaching and training self-development programs have similar popularity to the self-development books. For example, Anthony Robbins, who is a famous self-development coach (Stein, 2010; Yentob, 2008), has been conducting his programs in many countries including the United States of America, Canada and Australia, where he has trained millions of people (A. Robbins, 2011) and influenced such leaders as former United States President, Bill Clinton (De Witt, 1995; Yentob, 2008). Another study showed that 39% of participants who attend self-development programs had their fees paid by their business owners and National Social Insurance (Fernros, Furhoff, & Wändell, 2005), which is indicative of the acceptance of self-development programs by society and governmental bodies. This shows clearly that self-development books and programs have become prominent and that using them is common practice around the world.

One example of self-development programs is the “How to Be an Ultra-Super Student” program, which will be used as the intervention on the target population of this thesis. This program has been provided since 2008 to date by the author of this thesis himself, as he is a qualified trainer and self-development coach. The program contents, which will be detailed further on in the Methodology Chapter, were developed from the author's personal experience and his reading in self-development material. The program was also continually adjusted according to the author’s observations and feedback from attendees’ assessment. The program aims to improve the students’ academic performance, psychological health and to foster the life satisfaction of the participating students. Around 3,000 high school and university students have attended this program since 2008 in Saudi Arabia. The author has acquired two certificates of training from private organisations: one from the Canadian Training Centre of Human Development in 2009, and one from The Global...
Academy for Training and Development in 2012. In addition, he has seven years of experience in the field.

Despite the popularity achieved by self-development programs in general, there is little scientific critical evaluation as to the effectiveness of those self-development coaching programs that are given to the general population (Fernros et al., 2005; Fernros, Furuhoff, & Wändell, 2008). Few interventional studies have found self-development programs to positively impact on participants’ psychological health (Fernros et al., 2008; Holm, Tyssen, Stordal, & Haver, 2010), but there is not enough body of knowledge from which to draw a firm conclusion about the effectiveness of such programs. Moreover, researchers cast doubts on the claims made by self-development authors who usually vigorously promote their programs with claims that they have been subjected to varying levels of scientific scrutiny (Grant, 2001a; McAllister, 2007). Researchers also criticize the validity of accreditation and the credentials of self-development coaches and authors who present themselves as coaches and experts in the field (Grant & O’Hara, 2008; Zimmerman, Holm, & Haddock, 2001) or as therapists (Zimmerman et al., 2001). This sceptical view of self-development books is important, especially in light of the fact that other, evidence-based written material, such as bibliotherapeutic books, have been written by professional psychologists or psychiatrists. In fact, the self-development notion is not well understood in current literature.

To sum up, despite the clear popularity of self-development programs and the promising findings of some studies, the concept of self-development programs is not very clear in its explication, and the evidence supporting the validity of such programs is still weak. This justifies the significance of the author’s work in investigating the effectiveness of such a program. The author also aims to evaluate a self-development program for medical and dental students, as they are an important population whose needs in the arena of psychological health are well worth addressing. It is important to make clear that self-development programs will be reviewed thoroughly for further understanding. However, this work does not aim to provide an understanding or build a theoretical framework for self-development programs and their processes of behavioural change as this falls outside the scope of this thesis.
Theoretical Framework

There are many factors, at multi-levels, that may affect the health of a population. Among the latest researchers in public health, the ecological model is widely used in exploring health determinants. It was defined (McLaren & Hawe, 2005, p.9; McLeroy et al., 1988) as a theoretical framework designed to draw attention to individual and environmental determinates of behaviour and health, including intrapersonal factors (such as knowledge, skills and attitude); interpersonal factors (such as family, friends, and co-workers); institutional factors (such as university, schools, workplace, and transportation); community factors (such as the relationship between the different organisations); and public policy (such as the laws at a national level).

Self-development coaching programs aim to enhance an individual’s psychological health by focusing on the intrapersonal level – and it should be noted that they do not aim to make direct improvement in the aspects of the ecological model.

Thesis Aims and Objectives

The main aim of this thesis is to evaluate the effect of implementing a self-development coaching program—“How to Be an Ultra-Super Student”—to improve the psychological health and academic performance of preclinical medical and dental students at multiple time points prospectively in Makkah, Saudi Arabia. The thesis also aims to evaluate the psychological health of the targeted population from cross sectional and longitudinal perspectives. The thesis objectives are outlined as follows:

1. Evaluate the positive and negative aspects of the psychological health among the targeted population and to identify the highest risk groups.
2. Follow up on, and evaluate the changes in the positive and negative aspects of psychological health prospectively among the target population.
3. Investigate the effect of the “How to Be an Ultra-Super Student” self-development coaching program on positive and negative psychological aspects and on the academic performance of the target population, which is the main objective of this thesis.
Research Questions

The thesis objectives are formulated into the following research questions:

1. What is the prevalence of depression, anxiety, stress, self-efficacy and life satisfaction among preclinical medical and dental students in Makkah, Saudi Arabia? (Answered by Study 2, Chapter 5).
2. Do levels of depression, anxiety, stress, self-efficacy and life satisfaction, change prospectively in the same academic year among the targeted population? (Answered by Study 3, Chapter 6).
3. What are the groups of students at highest risk of depression, anxiety, and stress, as well as of lower life satisfaction and self-efficacy, among the target population? (Answered by Studies 2 and 3, Chapters 5 and 6).
4. Does the self-development coaching program “How to Be an Ultra-Super Student” affect the following variables among preclinical medical and dental students in Makkah, Saudi Arabia: (Answered by Studies 4 and 5, Chapters 7 and 8):
   a. Depression
   b. Anxiety
   c. Stress
   d. Self-efficacy
   e. Life satisfaction
5. Is the effect of the self-development coaching program “How to Be an Ultra-Super Student” influenced by:
   a. Levels of credibility/expectancy towards self-development programs. (Answered by Studies 4 and 5, Chapters 7 and 8).
   b. Coaching program characteristics: the level of relevance, acquiring of experience in the program content, and satisfaction. (Answered by Studies 4, Chapter 7, and the Chapter 9).
   c. Coach characteristics from participants’ perspectives: the ability to influence emotions, use of personal experience, considering the coach as a role model, levels of empathy, persuasion, confidence, attraction level, and motivation. (Answered by Study 4, Chapters 7 and 9).
Chapter 1: Introduction

Thesis Significance and Contribution

The significance of this project comes from the population used and the nature of the intervention used. Its contribution comes from filling multiple gaps in knowledge. The results of this project will provide valuable information on the students’ psychological health, which is an indicator of the dropout rate in such populations (Dyrbye et al., 2010). This is important, especially when there is a serious shortage in the Saudi health workforce (Almalki et al., 2011).

Medical and dental students in Makkah will most likely form the core of the Makkah healthcare workforce once they have graduated. As explained in the introduction, they will be the frontline staff in treating and dealing with the millions of pilgrims who visit Makkah for religious purposes every year. They will deal with pilgrims from multicultural and multilingual backgrounds. Potentially, they will be in contact with many infectious diseases such as Corona-virus and Swine flu (influenza N1H1) (Al-Tawfiq & Memish, 2012; K. Khan et al., 2010). Due to the above circumstances, the students are expected to encounter a greater psychological burden than other students in Saudi Arabia. Yet, no study has evaluated these students’ psychological health to determine if support is needed during their undergraduate years to enable them to manage any psychological burden.

To the author’s knowledge, this thesis includes the first scientific longitudinal investigation of psychological health among medical students in the Middle East. It is also the first to investigate this population’s positive psychological states, as other studies have focused only on the negative aspects of psychological health.

The author is also evaluating the effectiveness of a self-development coaching program, and as discussed in the literature review study, Chapter 3, there is very limited research into the effectiveness of such programs. The results of this project provide empirical evidence about the integrity of some self-development promotional claims.

This thesis includes the first study in the world that tries to improve dental students’ psychological health according to the best of our knowledge. Further, to the author’s knowledge, this thesis presents the first interventional study of a self-development coaching group and the psychological health of medical and dental students in the Middle East. This evaluation will help to illustrate the benefit of incorporating self-development programs in university curricula to help vulnerable groups (medical and dental students). This can be seen as an essential development as the higher education in Saudi Arabia is currently undergoing an expansion and reforming phase.
As a secondary result of this thesis, reviewing the literature in terms of self-development coaching programs (Study 1, Chapter 3) gives an initial body of knowledge for future investigation by researchers. However, it should be noted clearly that this thesis is not presenting a grounded theory to understand self-development coaching programs or their ways of changing individuals.

Thesis Structure

This thesis is constructed as a thesis-by-publication (five articles), and is, therefore, structured differently from the traditional thesis. The thesis is presented as a series of journal articles that are linked together by a number of summaries and organised into ten chapters. Following this introductory chapter, Chapters 2 and 3 constitute the literature review of this thesis as Chapter 2 presents a literature review regarding the psychological health of medical and dental students and the link between psychological health and academic performance. Chapter 3 presents a review of self-development coaching programs (content, providers, clients, validity, and their relation to adjunct practices); this is the first published article contained in this thesis. Chapter 4 is the methodology chapter for the whole thesis and the published studies.

The other four chapters of this thesis are presented in Chapter 5 through to Chapter 8 as published articles, and linked to the thesis objectives as displayed in Figure 1.1. Each study aimed to address a thesis objective by providing an introduction, methods, results, discussion, and conclusion. As all the studies are synchronised with one another, some repetition is necessarily found in the introduction, methodology, or discussion sections.

Chapter 9 presents an extra results presentation of the remaining data that were not analysed in the articles presented in the thesis. Finally, Chapter 10 presents a general discussion of all the studies and consolidates the material contained in the articles presented in this thesis. Additionally, it presents the answers to the research questions; some methodological matters; the strengths, limitations, recommendations and conclusions for the whole thesis.
Chapter 1: Introduction

Investigate the effect of the "How to Be an Ultra-Super Student" self-development coaching program on positive and negative psychological aspects and on the academic performance of the targeted population.

Paper 4: Improving dental and medical students’ psychological health using a self-development coaching program: A pilot study

Paper 5: The impact of a self-development coaching program on medical and dental students’ psychological health and academic performance: A randomised controlled trial

Assess the change in the positive and negative aspects of psychological health prospectively among the target population.

Paper 3: Psychological health of medical and dental students in Saudi Arabia: A longitudinal study

Assess the positive and negative aspects of psychological health among the targeted population and identify the highest risk groups.

Paper 2: Psychological well-being status among medical and dental students in Saudi Arabia: A cross sectional study

Figure 1.1. Diagram of thesis publications and how they meet the thesis objectives.
Chapter 2. Literature Review Part I: Medical and Dental Students’ Psychological Health

Introduction

Acceptance into medical or dental faculties is an important goal for many students and their parents. Many students apply for medical and dental schools to attain a guaranteed financial future, a prestigious job, and/or to satisfy the value of helping others (Al-Bitar, Sonbol, & Al-Omari, 2008; Karaoglu & Şeker, 2010; Millan et al., 2005). However, the public are, perhaps, not aware of the psychological distress accompanying the students’ educational journey in medical and dental schools and their professional careers, as indicated by literature around the world (Dyrbye et al., 2007, 2009; Gorter et al., 2008; Henning et al., 2009; Jurkat et al., 2011; Newbury-Birch et al., 2002; Polychronopoulou & Divaris, 2009).

The term psychological distress broadly includes depression, anxiety, stress, and psychological health related conditions (Dyrbye et al., 2006). Despite the necessity of optimal levels of stress for efficient learning and performing in such specialty areas as medicine and dentistry, many scholars have found the psychological health of medical and dental students to be psychopathological, and to be worse than the psychological health of students in other specialties (Dyrbye et al., 2007; Jurkat et al., 2011). This situation should be taken seriously given the associations between medical and dental students’ psychological health and suicidal ideation (Dyrbye et al., 2011; Galán et al., 2014). In fact, Dyrbye et al. (2011) found in a national study of medical students in the United States that 82% of medical students had one or more forms of distress which was associated with suicidal thoughts in a dose-response manner (Dyrbye et al., 2011). Medical students with two, four, or six forms of distress had a five, fifteen, and twenty-four fold risk respectively, of suicidal ideation in comparison with non-distressed students. Indeed, the psychological health status of medical and dental students (Dyrbye et al., 2008; Galán et al., 2014), as well as of physicians, is linked with suicide rates higher than those for the general population (Center et al., 2003). It could be argued that some studies found no suicidal ideation among medical students such as those in Saudi Arabia (Inam, 2007). However, these studies might have been affected by response bias, because participants may have concealed their suicidal thoughts due to
the extreme Islamic prohibition against suicide and due to social unacceptability of declarations of suicidal ideation in this country.

Furthermore, the poor psychological health among medical and dental students was also found to be associated with student dropout rates from their courses (Alzahem et al., 2011; Dyrbye et al., 2010). Any loss of students might affect the national healthcare workforce (Dyrbye et al., 2010). Not only that, but the students’ psychological distress has a high probability of continuing into their professional life, jeopardising their professional career and patient safety as well (Dahlin & Runeson, 2007; Tyssen & Vaglum, 2002). However, it seems that students and physicians’ psychological health has a low priority in the healthcare system, as there have been few rigorous attempts at improving the situation (Redwood & Pollak, 2007; Colin P. West et al., 2014). What increases concern, is that some studies have indicated that physicians and students themselves are reluctant to seek help, as only a small percentage do so (Center et al., 2003; Ey, Henning, & Shaw, 2000; Givens & Tjia, 2002).

A large number of factors, such as academic, administrative and personal factors, may lead to the poor psychological health of medical and dental students (Alzahem et al., 2011; Dyrbye et al., 2006). The academic factors were found to be the most distressing factors among medical and dental students, and include: workload, competition, students’ grades, future concerns, the long duration of academic days, the high number of examinations and a lack of time (Alzahem et al., 2011; Dyrbye et al., 2006; Roh et al., 2010; Salgar, 2014; Sani et al., 2012). In fact, academic factors were consistently found to be the major source of students’ psychological distress in previous systematic reviews and studies, in contrast to other factors.

Dyrbye et al. (2011) indicated that future research into student’s psychological distress should include more constructs such as depression, anxiety, and stress. The reported association between some of these constructs, such as that between depression and stress (Hammen, 2005), did not mean that they represented the same construct. Lovibond and Lovibond (1995) utilised the tripartite model of anxiety, depression and stress to develop the Depression, Anxiety and Stress Scale (DASS) that measures each one of these constructs as a separate subscale despite the fact that they are intercorrelated. Lovibond and Lovibond defined depression as involving dysphoria, hopelessness, devaluation, self-deprecation, anhedonia, and inertia. They also explained that anxiety, in contrast, involved autonomic arousal, skeletal muscular effects (e.g. shaking), subjective experiences of anxious affect (e.g. I felt terrified), and situational anxiety (e.g. worrying about situations in which one might panic and make a fool of oneself). They illustrated that stress, on the
other hand, involved difficulty in relaxing, nervous arousal, being easily upset or agitated and being irritable or over-reactive. Accordingly, the present literature review discusses depression, anxiety, and stress separately among medical and dental students in the following sections.

Furthermore, most research, when investigating medical and dental students’ psychological distress, focuses only on negative psychological health constructs. This does not comprise the full spectra of psychological health. The seminal work of Ryff (1989) illustrated that both negative and positive aspects should be included when discussing psychological health, which reflects the essence of the World Health Organization (WHO) definition of health: “Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (WHO, 1958). This is supported by a study of medical students that found that improving positive mental health alleviated students’ distress (Dyrbye et al., 2012). Thus, it is important to include the positive aspects of psychological health when reviewing the psychological health of students. Despite the low number of publications on the positive aspects of medical and dental students’ experiences, some of the positive psychological aspects, such as self-efficacy and satisfaction with life, were investigated in a considerable number of studies.

Therefore, the following chapter presents a literature review of research regarding depression, anxiety, stress, self-efficacy, and life satisfaction under separate subheadings. The review illustrates the prevalence of each construct and primarily compares this across the different genders, academic years and faculties (medical/dental). It also presents findings in the literature of each construct’s level across different time points in the same year and in different years prospectively. Each construct will be discussed with reference to different considerations of students’ mental health, focussing on medical students followed by dental students, according to the relevance of the research. The review also presents the findings on the relationship between the students’ psychological health and academic performance to fulfil the main aims of the thesis.

This review was done by searching electronic databases to find relevant literature, including Queensland University of Technology electronic library, PubMed, Psyc Info, and Google scholar for peer-reviewed articles and books, from January 2000 up to March 2014. Biographies and reference lists in the primary sources were also searched for relevant articles. Searched terms used combinations of medical-students, dental-students, depression, anxiety, stress, self-efficacy, satisfaction with life, psychological health, academic performance, and grade point average. Due to scarcity of sources on Saudi medical and dental students, which are the target population in this thesis, the review primarily involved studies from other countries, but it highlighted any results
from Saudi literature and compared them with results from the literature on other countries. All peer-reviewed resources written in English were eligible for this review, but only relevant literature was included. The sources that investigated other psychological constructs such as burnout and quality of life, or other populations such as school students, non-medical/non-dental students, postgraduate students, medical doctors and dentists, were excluded from consideration.

It is important to emphasise that the constructs reviewed in this chapter for the negative aspects (depression, anxiety, and stress) and the positive aspects (self-efficacy and satisfaction with life) of psychological health do not comprehensively assess psychological health. Also, most of the research goes beyond the clinical investigation, but still provides good illustration of investigation of psychological health status.

**Depression in Medical and Dental Students**

Depression is defined as "A state of mind characterised by negative mood, low energy, loss of interest in usual activities, pessimism, unrealistically negative thoughts about self and the future, and social withdrawal" (Matsumoto, 2009, p. 156). Experiencing depressive symptoms for a short term is normal, but is considered a disorder if it persists for a long period of time or if it interferes with daily activity (Matsumoto, 2009, p. 156). Depression is considered a common finding cross-culturally among medical and dental students. It is recommended that depression be given special attention within the medical and dental educational context, as studies have found an association between depression and low academic performance (Roh et al., 2010), dropout rate in medical students (Dyrbye et al., 2010), and suicidal ideation in medical and dental students (Dyrbye et al., 2008; Galán et al., 2014). The following section summarises the findings in the literature of depression levels among medical and dental students in comparison with the findings of the same among the general population and other specialties. It also presents information on the prevalence of depression in Saudi Arabia and other countries, and the changes in the levels of depression longitudinally within the same year and across different years. It also illustrates the relevance of the relationship between depression and the year of study, gender, and income among medical and dental students.

Some studies have indicated that depression prevalence among medical students was higher than in the general population in the United States and in Sweden (Dahlin, Joneborg, & Runeson, 2005; Dyrbye et al., 2006). This is supported by a study in Turkey that found rates of depression
among medical students were higher in the second year when compared to the rates among their peers in other specialties (economics and physical education) (Aktekin et al., 2001). However, those studies contrasted with a study in the United Kingdom that found medical students’ percentage of depression to not be higher than that of the general population, even after following students for one year (Quince, Wood, Parker, & Benson, 2012). The difference in Quince’s study might be due to the prevalence of depression in the United Kingdom being considered low in comparison to that in other countries, as will be discussed below.

No study has compared depression levels among dental students with those among the general population. Three studies compared depression levels in dental students with medical students (Newbury-Birch et al., 2002; Lee, Othman, Othman, & Yasin, 2013; Prinz, Hertrich, Hirschfelder, & de Zwaan, 2012). All of them found dental students to be more depressed than medical students in the junior and senior years.

In an overview of literature studying medical students, studies showed that the prevalence of depression varied between different countries, ranging from the United States, 49.0–56.2% (Dyrbye et al., 2007; Schwenk, Davis, & Wimsatt, 2010); the United Kingdom, 2.7–10.6% (Newbury-Birch et al., 2002; Quince et al., 2012); Sweden, 12.9% (Dahlin et al., 2005); Macedonia 10.4% (Mancevska, Bozinovska, Tecce, Pluncevik-Gligoroska, & Sivevska-Smilevska, 2007); Pakistan, 35.1–43.89% (Alvi, Assad, Ramzan, & Khan, 2010; Jadoon, Yaqoob, Raza, Shehzad, & Zeshan, 2010); South Korea, 2.9–10.3% (Roh et al., 2010); Malaysia, 18.8% (Lee et al., 2013); and United Arab Emirates, 28.6% (Ahmed, Banu, Al-Fageer, & Al-Suwaidi, 2009). This variability might result from different educational systems, teaching, and evaluation in the different institutes involved in these studies, as well as from use of different instruments to measure depression. It should be noted that the Roh et al. study was the only one which investigated depression on a national scale. The Dyrbye et al. (2007) study was conducted across five universities, while others were conducted with students from one university.

Studies in Saudi Arabia have found the prevalence of depression among medical student to be 48.2% in King Saud University, Riyadh (Al-faris et al., 2012); 44–66% in Qassim University, Al-Qassim (Inam, 2007); and 36.4% among females in King Abdulaziz University, Jeddah (Ibrahim, Al-Kharboush, El-Khatib, Al-Habib, & Asali, 2013). Thus, the overall prevalence of depression among Saudi medical students is considered to be higher relative to that of other countries except for the United States. The reason for this is not known but, again, might be
attributed to the differences in educational systems. Nevertheless, more studies might be needed to investigate the reasons.

Similarly, the prevalence of depression among dental students has been documented and found to vary by country, for example: 14–15% in the United Kingdom (Newbury-Birch et al., 2002); Spain, 3.8–14.5% (Galán et al., 2014); 2.8% in Germany (Prinz et al., 2012); Japan 31.4–37.2% (Takayama, Miura, Miura, Ono, & Ohkubo, 2011); and Malaysia 41% (Lee et al., 2013). The above statistics from European countries suggest that in general, they have a lower prevalence of depression among both medical and dental students in comparison to other countries for which data are available. To the best of the author’s knowledge, no study has investigated the prevalence of depression among the Saudi dental student population in particular, which highlights a gap in knowledge.

Measuring depression at different times of the academic year might result in different findings. Yusoff and colleagues in a cohort-design study, followed the level of depression among Malaysian medical students within their first year, and found that depression had increased gradually over five follow up waves from admission until final examinations (Yusoff, Abdul Rahim, et al., 2013). This indicated that the medical students had higher levels of depression in the same academic year when approaching their final examinations period. This point is a suggested explanation for some of the degrees of variability between different studies, as measuring depression might vary from one study to another according to data collection time within a particular academic time frame. No longitudinal study tracked depression changes among dental students, and no such longitudinal study has been undertaken in Saudi Arabia to track medical or dental students.

Bearing in mind the differences in the structure of the academic-year in different countries, a number of cross-sectional studies investigated the impact of study in different academic years on the level of depression among students. Two well-conducted studies in the United States found students in the year in which students transition into the clinical ward (the third year in a four-year medical program) to be the most depressed (Compton, Carrera, & Frank, 2008; Schwenk et al., 2010). However, two studies in South Korea and Pakistan found that first year medical students were the most depressed (Alvi et al., 2010; Roh et al., 2010). Alvi and colleagues, and Roh and colleagues both produced results which were consistent with two studies in Saudi Arabia (Al-faris et al., 2012; Inam, 2007). Nevertheless, a study by Jadoon et al. in Pakistan found a fluctuation in the prevalence of medical students’ depression as the first, second, third (transition to clinic), fourth
and fifth years, had depression levels of 45.86 %, 52.58%, 47.14%, 28.7%, and 45.10%, respectively (Jadoon et al., 2010).

In contrast to the above studies, two longitudinal studies in the United Kingdom found that the mean of the medical students’ depression did not change significantly as students were followed across different years (Newbury-Birch et al., 2002; Quince et al., 2012). Quince et al. only found a transitory and small increase in depression levels among medical male students after following the same students across different years (Quince et al., 2012). Newbury-Birch et al. also found no change after following medical students from the second to fifth year. This was further supported by another cohort study in Sweden, where the authors found depression levels did not change significantly between the first and third year among medical students (Dahlin & Runeson, 2007). In contrast, Aktekin and colleagues, in another cohort study in Turkey, found a significant increase in medical students’ depression in the second year, compared to their baseline in the first year, by approximately two-fold (Aktekin et al., 2001). From the above contradictions it might be adduced that American medical students are more depressed in the transitional year, while the European students have no change in levels of depression between years. In contrast, the students in the Asian and Middle Eastern countries are depressed in their first year. An explanation for these differences could lie in the variability between the different educational systems in these countries. However, further international investigation is needed to identify the primary sources of variability.

It is noted that studies of dental students have produced more consistent results. Two cross-sectional studies in Turkey (I. Peker, Alkurt, Usta, & Turkbay, 2009) and Spain (Galán et al., 2014), in addition to the longitudinal study in the United Kingdom by Newbury-Birch et al. (2002), found that dental students’ depression levels did not change in different years. However, it should be noted that none of the above studies of dental students included all academic years, in particular not the transitional clinical year. This would be worthwhile investigating in future studies.

Most previous studies, including those in Saudi Arabia, have shown that female medical students exhibited more depressive symptoms than males (Compton et al., 2008; Dahlin et al., 2005; Dyrbye et al., 2006; Inam, 2007; Jadoon et al., 2010; Mancevska et al., 2007; Roh et al., 2010). Only one article on medical students (Lee et al., 2013) found no gender difference. In fact, this situation was observed universally: that greater prevalence of depression was found among females when compared to males, regardless of country or culture (Sadock & Sadock, 2003, p. 535). Lee et al.’s results might present the lone exception to this case among medical students.
By contrast, dental students were less consistent with regard to gender difference, as three studies found females to be more depressed (Newbury-Birch et al., 2002; Prinz et al., 2012; Takayama et al., 2011), while another three studies found no gender difference (Galán et al., 2014; Lee et al., 2013; I. Peker et al., 2009) The inconsistency of results from among dental students might indicate that female dental students respond differently to depressive triggers in some dental student populations. Nevertheless, male medical and dental students were never found to be more depressed than females.

Financial difficulties were found to be associated with high depression levels among medical students (Dyrbye et al., 2006; Yusoff, Yee, et al., 2011). Conversely, two studies found that income was not associated with depression among dental students (Lee et al., 2013; I. Peker et al., 2009). Consideration should be given to different cultural circumstances and governmental policies, as some countries provide education with tuition fees, whereas a country like Saudi Arabia gives students a monthly allowance to complete their education.

Furthermore, religious and spiritual variables should be taken into consideration. For example, praying, which is a prominent religious practice in Muslim countries such as Saudi Arabia and Iran, was found to be associated with depression reduction among Iranian medical students (Ranaie, Zaheri, & Ardalan, 2011). Religious differences should be taken into consideration when studying any religious country such as Saudi Arabia.

It seems that comparing means of depression from among the previous articles is more appropriate than studying percentage rates; however, depression in the previous studies was measured using different instruments and different cut-off points, which could be the source of result variability. Among those instruments were the Beck Depression Inventory (BDI) (Beck, Ward, & Mendelson, 1961), the Hospital Anxiety and Depression (HAD) scale (Zigmond & Snaith, 1983), and the Depression Anxiety Stress Scale (DASS21) (Henry & Crawford, 2005; Lovibond & Lovibond, 1995). Thus, the comparison was not conducted by mean, but rather by percentage.

To sum up, depression is clearly a problem which affects medical and dental students worldwide. Depression prevalence has been found to be different among different studies in different countries. Dental students are more depressed than medical students. Saudi students have a relatively high prevalence of depression amongst medical students, but no information has been found regarding Saudi dental students. Levels of depression change within the academic year and peak at examination time. The effect of the time of academic year has been found to be inconsistent among countries, but Saudi literature has found first year medical students to be more depressed.
than others. Depression in dental students seems less sensitive to the academic year, but that has not been confirmed in Saudi Arabia. Female medical and dental students are most likely to be depressed. Other socio-cultural factors such as income and religious practice should be taken into consideration when studying some populations such as the Saudi population.

**Anxiety in Medical and Dental Students**

Anxiety is defined as “an unpleasant emotional state or condition that is characterised by subjective feelings of tension, apprehension, and worry, and by activation or arousal of the autonomous system” (C. Spielberger, 1972, p. 482). The environment of medical and dental education is considered as being intense and demanding on students (Alzahem et al., 2011; Dyrbye et al., 2006), which explains the high prevalence of anxiety among medical and dental students. Indeed, anxiety should be taken seriously as it is a major risk factor for impairment of performance (Ballenger et al., 2001). The following section displays anxiety levels in medical and dental students when compared to those of the general population and other specialities. It presents the anxiety prevalence in Saudi Arabian student populations and those of other countries, and the changes in levels of anxiety longitudinally within the same year and across different years. It also illustrates the relationships between anxiety and the year of study and gender among medical and dental students.

When investigating anxiety prevalence in the literature, it was found that medical students in Turkey were more anxious than their peers in other specialities (economics and physical education) (Aktekin et al., 2001). Newbury-Birch and colleagues’ (2002) research indicated that dental students were found to be more anxious than medical students, but the study showed that this difference was only noticed in the clinical year, whereas anxiety levels were similar in the second (preclinical) year. This was also supported by another study in Germany that found a significantly higher mean of anxiety among senior dental students as compared to among corresponding medical students (Prinz et al., 2012). A thorough review of the literature found no article which investigated the anxiety of dental students in comparison to that of the general population, or of other specialities.

The prevalence of anxiety among medical students was measured among medical students in many countries and the following results were found: in the United States, 11.5% (Chandavarkar, Azzam, & Mathews, 2007); Brazil, 30.8% (Bassols et al., 2014); the United Kingdom, 26–47%
(Newbury-Birch et al., 2002); Lithuania, 45% (Bunevicius, Katkute, & Bunevicius, 2008); Estonia, 21.9% (Eller, Aluoja, Vasar, & Veldi, 2006); Macedonia, 65.5% (Mancevska et al., 2007); Turkey, 20.3–44% (Akvardar, Demiral, Ergor, & Ergor, 2004; Karaoglu & Şeker, 2010); Pakistan, 43.89–70% (Inam, Saqib, & Alam, 2003; Jadoon et al., 2010; M. S. Khan, Mahmood, Badshah, Ali, & Jamal, 2006); and the United Arab Emirates, 28.7% (Ahmed et al., 2009).

In Saudi Arabia, anxiety prevalence was found to be 44–66% in Qassim city (Inam, 2007), and 68.2% among female medical students in Jeddah city (Ibrahim et al., 2013), which indicates that anxiety in medical students from Saudi Arabia seems to be in the high prevalence range from among those students from all countries investigated. Indeed, this prevalence range might be due to the variety of medical educational environments, forms of assessment, and varying curricula in different countries and the various institutes. Again, it is not clear what reasons lead Saudi students to have this high prevalence, which highlights another gap for further investigation.

In contrast, studies on the prevalence of anxiety in dental students were not as abundant as for medical students. In fact, the only study into the prevalence of anxiety among dental students was Newbury-Birch’s study in the United Kingdom that found the prevalence of anxiety to be 47–67%. There were other studies which investigated anxiety among dental students (Barbería, Fernández-Frías, Suárez-Clúa, & Saavedra, 2004; Brand & Schoonheim-Klein, 2009; Kieser & Herbison, 2000; I. Peker et al., 2009; Sugiura et al., 2005) but these were not focussed on investigating the prevalence of anxiety. Moreover, no study was found at all which investigated anxiety in Saudi dental students.

Yusoff and colleagues investigated the prevalence of anxiety in a longitudinal study at five points among first year students in Malaysia and found that the anxiety level fluctuated with two peaks: at the beginning of the year and at examination period (Yusoff, Abdul Rahim, et al., 2013). This indicated that anxiety might be event-sensitive and acted differently from depression, which showed progressive escalation in the same sample, as discussed earlier. This also emphasises the importance of stating the time of data collection in such studies.

Investigation of the literature regarding anxiety in different academic years revealed that most, but not all, studies found students in the early years of their medical studies to be most anxiety-prone. This was found in multiple cross-sectional studies in the United Arab Emirates, Pakistan, Brazil, and Saudi Arabia (Ahmed et al., 2009; Alvi et al., 2010; Bassols et al., 2014; Inam, 2007). This was also found in a longitudinal study in the United Kingdom, that found anxiety prevalence to be 47% in the second year, but was reduced to 26% by the fifth year (Newbury-Birch
et al., 2002). This is not considered to contradict the longitudinal study by Aktekin et al. because although that study found that the anxiety level increased significantly from the first to the second year in Turkey (Aktekin et al., 2001), the first and second years are still regarded as among the early academic years. Furthermore, a cross-sectional study in Turkey found students’ mean baseline anxiety in the first medical year to be higher than that of their follow up in the sixth year (final) (Akvardar et al., 2004). This might indicate that students tend to develop more anxiety in the preclinical (early) years, and then this reduces in the later (clinical) years. The reason for medical students to be more anxious in their early years might be that they are unfamiliar with different challenges which they will have become familiar with by the final years.

In contrast to the above, a study in the United States, supported by another study in Saudi Arabia, found that there were no significant differences in anxiety prevalence between different academic years among medical students, though they indicated slightly higher levels of anxiety among senior students (Chandavarkar et al., 2007; Ibrahim et al., 2013).

The above finding illustrates inconsistent findings as to the effect of the academic year on anxiety among medical students, and this inconsistency was also observed among different studies in Saudi Arabia (Ibrahim et al., 2013; Inam, 2007). The inconsistency in the Saudi literature findings might be attributable to differences in the educational system for each university in each study, or to the fact that Ibrahim et al. investigated only female medical students. However, both of the Saudi studies’ findings were supported by other non-Saudi studies. Hence, multicentre study in Saudi Arabia needs to be conducted to clarify the effect of academic year on medical students’ anxiety levels.

Unlike the data for medical students, a number of cross-sectional studies found that anxiety among dental students was higher at the transitional year into clinics in Spain and Japan (Sugiura et al., 2005; Barbería, 2004). Newbury-Birch et al. (2002) found in their study that anxiety increased among dental students from 47% in the second year, to 67% in the fifth year, which might support the previous literature by indicating that anxiety levels might be higher in clinical years in general than in preclinical years among dental students, while the peak is at the transitional year. Barbería et al. explained that students in the clinical transitional year have a perfectionist attitude and undergo a genuine testing of their practical knowledge through dealing with real patients (Barbería et al., 2004). Studies showed that dental students in clinical years, experience a number of events such as giving local anaesthesia (Meechan, 2005), fear of harming patients, patients getting infections, and managing prospective medical emergencies (Kieser & Herbison, 2000), all of which are strongly
suggestive as to the underlying cause of the increase in their anxiety, and which might not be encountered in the medical clinical-transitional year. Dental students at this stage do treat patients using actual invasive practice such as cutting dental tissue when making a dental filling, even though under faculty staff supervision. Nevertheless, there was one study in Turkey which indicated that there was no difference in anxiety induced by the different academic year among dental students (I. Peker et al., 2009). That study might be a singular case, whereas the other literature was consistent in findings; but future studies must be conducted in Saudi Arabia among dental students, because a lack of such data constitutes a gap in knowledge.

In relation to gender, a consistent finding in the literature is that female medical students are more anxious than male students (Bassols et al., 2014; Chandavarkar et al., 2007; Dyrbeye et al., 2006; Inam, 2007; Jadoon et al., 2010). However, one study in Turkey found no difference (Akvardar et al., 2004).

Findings regarding the gender differential are not consistent in the dental literature. For example, female dental students were found to be more anxious in Spain and Japan, as well as in Saudi Arabia, when compared to males (Barbería et al., 2004; Inam, 2007; Sugiura et al., 2005). One author offered an explanation based on cultural norms involving the extra roles required of the women in housekeeping in addition to their duties in dentistry (Barbería et al., 2004), which might be similar to the norms of Arabic culture in Saudi Arabia. However, Newbury-Birch et al.’s study in the United Kingdom indicated that female dental students had a higher anxiety percentage in the second year, while males were higher in the final dental years. Nevertheless, this was contradicted by two studies in New Zealand and Turkey that found no gender difference (Kieser & Herbison, 2000; I. Peker et al., 2009). This data seems to indicate that dental students are more inconsistent in regards to gender effect, which is similar to the data on depression in the dental literature, which urges more studies to investigate these outcomes.

Direct comparison of findings from studies would be valuable, but different instruments were used among studies to measure anxiety among the students such as: the State-Trait Anxiety Inventory (STAI) (Spielberger & Gorsuch, 1983); the Beck Anxiety Inventory (BAI) (Beck, Epstein, Brown, & Steer, 1988); the Hospital Anxiety and Depression (HAD) scale (Zigmond & Snaith, 1983); and the Depression Anxiety Stress Scale (DASS21) (Henry & Crawford, 2005; Lovibond & Lovibond, 1995). It is reasonable to posit that using different instruments and cut off points might be another reason for the different prevalence of anxiety findings among students.
It seems that anxiety, like depression, is also a psychological state internationally prominent among medical and (especially) dental students. Saudi medical students have been shown to have among the highest prevalence of anxiety in the countries where research has been undertaken. Anxiety in medical students seems to be higher than in their peers, except that anxiety among dental students is more pronounced than in medical students. Anxiety peaks more at the beginning of the year and at examination times among medical students. The early years present as a time of greater anxiety in medical students, whereas the clinical year in dentistry is the more pronounced for prevalence of anxiety, especially the clinical transitional year. Female medical students exhibit more anxiety than male medical students. However, the gender effect seems to be unclear among dental students. Limited literature was found on the prevalence of anxiety among dental students, and no study was found on the prevalence of anxiety among Saudi dental students. In addition, multicentre and longitudinal studies among medical and dental are needed to investigate the anxiety trajectory and to compare between different educational institutions.

**Stress in Medical and Dental Students**

Stress was the most researched psychological condition among medical and dental students in the literature in comparison to other conditions investigated in this thesis. Stress has been defined as “a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being” (Lazarus & Folkman, 1984, p. 19). Stress can be useful to accomplish tasks sometimes, but its persistence can result in a psychopathological condition and reduction in learning and achievement (Alzahem et al., 2011). In accordance with the very demanding nature of medical and dental education, students in these specialities were found to be highly stressed in many systematic reviews (Alzahem et al., 2011; Dyrbye et al., 2006; Elani et al., 2014). In many studies, the academic-related problems such as exams, heavy workload, fear of failure, and lack of time to study, were found to be the most prominent stressors for medical students (Jadoon et al., 2010; Saipanish, 2003), and also for dental students (Alzahem et al., 2011; I. Peker et al., 2009; Polychronopoulou & Divaris, 2005), although other non-academic factors were reported. Al-Sowygh (2013) pointed to the language barrier among the first year dental Saudi students as an important source of stress. This should be considered in those cultures where students are required to study purely in English for both medical and dental courses after spending 12 years in primary and secondary schools studying in Arabic.
It is important to address the problem of stress within medical and dental student cohorts because some studies have indicated that more than half of medical and dental students do not have stress coping strategies (Jurkat et al., 2011). In addition, studies have indicated that stress is a predictor of low academic performance among medical students (Abdulghani et al., 2011; Sanders & Lushington, 2002) and dental students (Al-Saleh et al., 2010; Silverstein & Kritz-Silverstein, 2010) and is associated with future burnout (Gorter et al., 2008), poor physical health (Gorter et al., 2008; Silverstein & Kritz-Silverstein, 2010) and sleep problems (Sreeramareddy et al., 2007) among dental students especially. This illustrates the importance of investigating the stress construct among medical and dental students. The following section discusses medical and dental students’ stress prevalence compared to that among the general population and to that among other specialties. It presents stress prevalence among students in Saudi Arabia and other countries, and the longitudinal changes in stress levels within the same year and across different years. It also illustrates the relevance of the relationships between stress and the year of study, gender, marital status and income among medical and dental students.

Ahtekin and colleagues (2001) found stress in medical students was higher than in their peers in the general population in Turkey. This was also found in Saudi Arabia when comparing female medical students with their non-medical peers (Al-Dabal, Koura, Rasheed, Al-Sowielem, & Makki, 2010). Similarly, stress in dental students was found to be higher than in their peers in a study in India (Mane, Krishnakumar, Niranjan, & Hiremath, 2011). This paradigm was consistently apparent: that dental students exhibit higher stress levels when compared with medical students in studies conducted in different countries (Mane et al., 2011; Murphy, Gray, Sterling, Reeves, & DuCette, 2009). This finding was augmented by other studies that investigated multiple institutes simultaneously (Birks, McKendree, & Watt, 2009; Humphris et al., 2002). This might be due to dental students having additional special stressors as compared to medical students. Besides the academic stressors in the preclinical years in dental education, students in their clinical years are more stressed by their experiences of patient treatment, clinical requirements, and concerns about their future (Al-Sowygh, 2013; Polychronopoulou & Divaris, 2005). It is relevant to reiterate that dental students in general are required to treat patients in the clinical years and to have contact with them to fulfill their program’s requirements, which might be an additional burden to that of their studies.

The prevalence of stress among medical students tends to differ between countries, for example: United Kingdom, 23% (Newbury-Birch et al., 2002); Finland, 36–40% (Niemi & Vainiomäki, 2006; Turkey, 17.6–47.9% (Ahtekin et al., 2001); Malaysia, 50% (Yusoff, Yee, et al.,
another three studies investigated stress in Saudi medical students, and found stress prevalence to be 63%, in King Saud University, Riyadh city (Abdulghani et al., 2011); 48.6% among the female students in Dammam University, Dammam city (Al-Dabal et al., 2010); and 71.9% in Jizan University, Jizan city (Sani et al., 2012). Despite the variability of stress levels found across different medical institutes in Saudi Arabia, the prevalence of stress is considered to be among the highest percentages when compared to results from other countries. It should be noted that none of these studies was conducted on a national scale.

Although many studies investigated stress sources or other stress-related issues among dental students, few studies assessed the prevalence of stress; however, those that did, indicated that the results for prevalence of stress, were more comparable with those of other countries than with the results of studies investigating stress in medical students, for example: the percentage of United Kingdom dental students with stress symptomatology was 72% (Newbury-Birch et al., 2002) and in Jordan it was 70% (Abu-Ghazaleh, Rajab, & Sonbol, 2011). However, it is not clear if this similarity is due to the limited number of studies which discussed the prevalence of stress or if this reflects the reality. Furthermore, all the studies which investigated stress in Saudi dental students such as (Al-Saleh et al., 2010; Al-Samadani & Al-Dharrab, 2013; Al-Sowygh, 2013; Alzahem, Van der Molen, & De Boer, 2013; Pani, Al Askar, Al Mohrij, & Al Ohali, 2011) did not provide direct findings on the prevalence of stress, but were researching other questions relating to stress. This should be addressed in further research as it gives rise to a significant gap in knowledge of this important factor.

When investigating the trajectory of stress through the academic year, two longitudinal studies found stress among medical students in the first year to increase gradually from the beginning of the year to toward the final examination time of that same academic year (Niemi & Vainiomäki, 2006; Yusoff, Abdul Rahim, et al., 2013). Similarly, two other longitudinal studies on dental students in the United States (Silverstein & Kritz-Silverstein, 2010) and in Saudi Arabia (Pani et al., 2011), found stress to increase from the beginning of the year to toward the final examination time. This is logical as the demands and study loads increase gradually from the beginning of the year until the examinations period at the end of the year.

Among medical students, year in the academic course was found to influence the prevalence of stress. However, studies in different countries produced different findings. The national study of medical students in the United States (Compton et al., 2008) found that the transitional year into the
clinical year was the most stressful. This was supported by studies in Thailand and Turkey which found that the third year was the most stressful (I. Peker et al., 2009; Saipanish, 2003). However, Dahlin et al. found the first year to be more stressful than the third and the sixth years in Sweden (Dahlin et al., 2005). Although another study in Nepal produced similar results, the authors stated that this difference was not statistically significant among the different years (Sreeramareddy et al., 2007). These results had some similarity to Saudi studies (Abdulghani et al., 2011), which found that the preclinical year in general, and the transitional into clinical year in particular, were more stressful than the clinical years. Thus, these cross sectional studies indicate preclinical years to be more stressful among medical students.

In contrast, longitudinal studies were consistent in their findings that medical students’ stress increased from early to later years: from the first year to the second (Aktekin et al., 2001) in Turkey, and from the first to the final year in Finland (Niemi & Vainiomäki, 2006). Furthermore, Newbury-Birch, et al. (2002) found that medical students’ stress continuously increased even after graduation as pre-registered physicians in the United Kingdom. This actually makes results more inconsistent. The longitudinal studies provide stronger scientific evidence than the cross-sectional design studies. So, it is suggested that cross-sectional studies were unable to detect increases in stress over time, as the studies reported the results of different students at different years simultaneously, yet these students might be experiencing different scenarios and challenges. However, this explanation is not supported by specific evidence. The other explanation is that students in different institutes in different countries might respond differently to stressors. No longitudinal study was found for Saudi medical students, which prevents comparison with the previous studies.

Nevertheless, findings from studies on dental students were more consistent. Most studies indicated that the transitional year from the non-clinical year into the clinical year is the most stressful in Canada and the United Kingdom (Dahan & Bedos, 2010; Radcliffe & Lester, 2003). This finding was aligned with all other studies in Saudi Arabia (Al-Saleh et al., 2010; Al-Sowygh, 2013; Alzahem et al., 2013). In fact, more generally, other studies found that the clinical years were in general more stressful than the preclinical (Alzahem et al., 2011; Fonseca et al., 2013; Pau et al., 2007). This was explained by the same reasoning as was discussed regarding anxiety among dental students above. However, a single study in Japan found that the academic year did not affect stress levels (Sugiura et al., 2005), which might be representative of circumstances for Japanese dental students only.
More interestingly, it was observed that stress levels among dental students differed from an institute to another (Silverstein & Kritz-Silverstein, 2010), and from one country to another (Gorter et al., 2008; Humphris et al., 2002; Polychronopoulou & Divaris, 2009), according to the apparent differences in the ways of teaching and through assessment. This was supported by a Saudi study that investigated multiple dental Saudi institutes (Al-Saleh et al., 2010). It is noteworthy that when Humphris and colleagues compared seven European institutes in five countries, it was indicated that curricula that required less contact with patients were found to be less stressful than other curricula (Humphris et al., 2002). Polychronopoulou and Divaris, on comparing six dental schools in different countries, found that institutes that used a problem-based learning approach generated less stressful outcomes than institutes that used the traditional approach (Polychronopoulou & Divaris, 2009). Gorter et al., after following up in five dental faculties in different European countries, found that the overall prevalence of stress did not change from the first year to the fifth (Gorter et al., 2008). However, different schools presented different stress patterns. For example, stress levels increased in Belfast, Amsterdam, and Cork, but decreased in Manchester and Helsinki. Authors explained this as a result of the different educational environment and curriculum in each university and county or city. These studies are important as they might explain the inconsistencies found among different studies conducted in different countries and institutes as to the influences of the academic year on stress results. Such studies of multiple institutes and multiple countries were not found, to the author’s knowledge, to have been conducted among medical students or to have investigated other constructs such as anxiety and depression. This represents further gaps in knowledge and addressing such gaps might provide other explanations for the variability of the results of those studies.

Furthermore, the majority of the studies from around the world, including from Saudi Arabia, found female medical students experienced higher levels of stress than did males (Abdulghani et al., 2011; Compton et al., 2008; Dahlin et al., 2005; Dyrbye et al., 2006; Polychronopoulou & Divaris, 2005; Sani et al., 2012). This was attributed regarded by the researcher as a product of female sensitivity, an increased tendency of females to report more distress and concerns than males do, and as an indicator of their higher levels of self-expectation and of their self-perceived lack of competence (Bayram & Bilgel, 2008; Chew-Graham, Rogers, & Yassin, 2003; Inam et al., 2003; Sanders & Lushington, 2002). However, only two studies of medical student cohorts found no difference between the two genders (Moffat, McConnachie, Ross, & Morrison, 2004; Niemi & Vainiomäki, 2006).
Among dental students, including among Saudi dental students, females are more likely to be stressed than males (Abu-Ghazaleh et al., 2011; Al-Saleh et al., 2010; Al-Sowygh, 2013; Alzahem et al., 2011; Fonseca et al., 2013; Pau et al., 2007; Sugiura et al., 2005). This can be attributed to the same reasons as for medical students above. However, some studies found no gender difference (Gorter et al., 2008; Humphris et al., 2002; Silverstein & Kritz-Silverstein, 2010). In fact, Silverstein found that female students were more stressed than males in the first year of dentistry, but after the follow up, males developed more stress in the second year and had a level of stress comparable with that of females. Only a single study in India found that male dental students were more stressed than females (Acharya, 2003). It is noted that studies investigating depression, anxiety and stress among medical students were more consistent in their findings that females were more distressed, than studies of dental students, which were less consistent about the gender effect.

In terms of marital status, two studies in Europe and the United States found no significant difference in stress levels between married and unmarried students (Humphris et al., 2002; Silverstein & Kritz-Silverstein, 2010). However, married dental students were found to be more stressed than singles in Saudi (Al-Sowygh, 2013). It might be that differences in social perspective and marital responsibility between the different cultures explain this. Married males and females were more likely to have more familial obligations and responsibilities in Saudi and Arab cultures than in other cultures, and that might affect students’ time management and availability, presumably increasing students’ stress. However, more research is needed to confirm this. This might be different in other cultures and with regard to educational policies as discussed before; however, the literature did not provide enough information in the Saudi context.

One factor which made comparisons between studies more difficult was that studies used different tools to measure stress such as: the General Health Questionnaire (GHQ) (Goldberg & Blackwell, 1970), the Dental Environmental Stress (DES) (Garbee, Zucker, & Selby, 1980), the Perceived Stress Scale (S. Cohen, Kamarck, & Mermelstein, 1983) the Higher Education Stress Inventory (HESI) (Dahlin et al., 2005), and the Depression Anxiety Stress Scale (DASS) (Lovibond & Lovibond, 1995).

In summary, psychological stress is another significant problem among medical and dental students, who do not usually seek help. Stress is associated with many undesirable health conditions. It was found to be a result of several academic problems and it results in low academic performance among both fields of study. Stress among medical and dental students was found to be higher than among their peers, but dental students were found to be more stressed than medical
students due to the additional activities involving psychomotor learning. Saudi medical students’ stress levels were considered to have the highest prevalence of those in the countries surveyed. A future study is needed to assess the prevalence of stress among Saudi dental students. Stress was found to increase from the beginning of the year to toward examination time in both fields of study. The effect of year of study was found to be inconsistent among medical students, whereas the clinical years and the transitional year to clinic especially, were found more stressful among dental students. These findings were supported by Saudi studies. Female medical and dental students were more stressed in most studies, including in Saudi Arabia. The effects of marital status and financial income impacts on stress might be different among different cultures. More importantly, multinational and multi-institutional studies indicated consistently that there were differences in stress according to institutional environment and geographical location for dental students. More research is needed to fill the highlighted gaps in knowledge.

Life Satisfaction in Medical and Dental Students

Life satisfaction can be defined as “a global assessment of a person's quality of life according to his chosen criteria” (D. C. Shin & Johnson, 1978, p. 478). Life satisfaction is seen as an essential dimension of subjective wellbeing and quality of life (Headey, Kelley, & Wearing, 1993; Pavot & Diener, 1993). Furthermore, life satisfaction has been used interchangeably with subjective wellbeing and happiness in literature (Diener & Clifton, 2002; Loewenthal, 1995), and found to be associated with positive psychological constructs such as hope and optimism (Shogren, Lopez, Wehmeyer, Little, & Pressgrove, 2006). Life satisfaction has been found to be a predictor of mortality (Idler & Benyamini, 1997), psychological morbidity and suicidal ideation (Koivumaa-Honkanen et al., 2001), and associated with psychological distress in dental students (Samaranayake & Fernando, 2011; Swami et al., 2007). This reflects its value as an indicator of the positive aspects of psychological health, and is the justification for choosing this construct to represent the positive aspect of psychological health in this thesis. The following section discusses satisfaction with life instruments then compares levels of satisfaction in medical and dental students with those in the general population and in populations in other fields of study. It presents the longitudinal changes of levels of satisfaction with life within the same year and across different years. It also illustrates the relations between satisfaction with life and the year of study, gender, and other factors among medical and dental students as relevant.
Since the satisfaction with life scale (SWLS) was invented (Diener, Emmons, Larsen, & Griffin, 1985), many scholars have used it to assess life satisfaction (Pavot & Diener, 2008). The SWLS mean (M) for the general population ranges from 23.6 to 26.9 in a large sample from a large number of countries (Pavot & Diener, 2008). More specifically, the mean for SWLS ranges M = 24.31, standard deviation (SD) of 4.96 for male university students, and M = 24.66, SD = 5.3 for female university students in Qatar, which is similar to Saudi Arabia geographically and socio-culturally. These details will help to understand the life satisfaction of medical and dental students compared to their peers.

Only a few articles have investigated satisfaction with life among medical and dental students. A national study in Norway found that the level of life satisfaction among medical students was not different across different universities, but found that medical students were found to be less satisfied than their peers in other fields of study (Kjeldstadli et al., 2006). This was supported by another study of Canadian medical residents in Alberta that found that though there was a high prevalence of life satisfaction among medical residents, the prevalence of satisfaction with life was lower than Alberta and Canada’s population norm (J. S. Cohen & Patten, 2005).

Conversely, a study investigating New Zealand students, with a median age of 20, found that medical students were more satisfied with their lives (M = 26.4, SD = 6.4) than their peers in health science, nursing, and architecture (Samaranayake & Fernando, 2011). However, this study also found that the psychological distress of the medical students was lower than that of their peers, which contradicted many other studies (Dyrbye et al., 2006). Samaranayake and Fernando explained that the low percentage of females in the sample does bring into question the study’s finding. Nevertheless, a study in India found medical students’ SWLS mean was 22.45 (SD = 6.26) (Boparai et al., 2013), which is lower than Samaranayake and Fernando’s SWLS mean, and lower than the population norm mentioned above. This might indicate that literature results are not coherent about the level of satisfaction among medical students in comparison to the general population.

Moreover, only one study, to the author’s knowledge, assessed dental students’ life satisfaction and found dental students to be significantly less satisfied than medical students (Jurkat et al., 2011). To the author’s knowledge, no study has been conducted in Saudi Arabia or the Arab world in regards to life satisfaction among medical or dental students.

One study in India assessed life satisfaction prospectively among medical students within the same academic year (Boparai et al., 2013). Boparai and colleagues found that life satisfaction
did not change at a more relaxed time, for example, at the beginning of the year than at a time of higher stress, for example, near to examinations. Nevertheless, the small sample size (101 participants) casts doubt on the power of the study to detect any difference. Furthermore, the nationwide Norwegian study by Kjedstadli and colleagues (2006) was the only study that assessed life satisfaction longitudinally across a six-year medical program, and this found that medical students were as satisfied as their peers in the first year. However, medical students’ satisfaction levels decreased by the third year and stayed low for the following three years up to graduation and this was the same for both genders (Kjeldstadli et al., 2006). Kjedstadli et al. explained that the high levels of life satisfaction of first year students as because these students had been accepted into the major of highest demand in Norway. However, Kjedstadli explained that students might become unable to cope with the medical education environment if it interfered with their social and personal life. There were no studies to assess life satisfaction neither prospectively within the same year, nor across different years for dental students, which highlights another gap in knowledge.

Both studies in Norwegian medical students and New Zealand dental students did not find life satisfaction to be influenced by gender (Kjeldstadli et al., 2006; Samaranayake & Fernando, 2011). Kjedstadli et al. explained that as being a product of gender equality in Norwegian society. This might be different in other contexts, where females have different socio-cultural responsibilities and expectations, such as in Saudi Arabia.

Investigation of other factors that influence life satisfaction lead to another study in Norway that investigated medical physicians and found an association between high life satisfaction and lower age, being married, lower job distress, exercise, and feeling socially supported (Tyssen et al., 2009). Another study in Qatar found an association among university undergraduate students in general between life satisfaction and personal perceptions of religiosity (Abdel-Khalek, 2013). This refers to the wide range of factors associated with life satisfaction that might influence satisfaction level, but it should be noticed that these studies did not investigate medical or dental students and were not retrieved from this researcher’s literature search pool. Nevertheless, the above discussion clearly indicates that life satisfaction is an inadequately researched topic among dental students when compared to depression, anxiety or stress, and not searched, to the author’s knowledge, among Saudi medical and dental students.

In sum, fewer studies investigated satisfaction with life among medical and dental students in comparison to depression, anxiety and stress. Although satisfaction with life seems to be high within medical students, it was found to be less so than in their peers. Satisfaction within life among
dental students was not clear in comparison to the population norm, but found to be lower than in medical students. Satisfaction with life seems to be stable across the same academic year but declines progressively when students advance to the next year among medical students. There was no longitudinal investigation of satisfaction with life among dental students. Satisfaction with life seems not to be affected by gender, but might be affected by age, marital status, social and religious status. Finally, there was no study which investigated satisfaction with life among medical or dental students in Saudi Arabia or the Arab world.

**Self-Efficacy in Medical and Dental Students**

Self-efficacy is defined as “people’s beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives” (Bandura, 1994). Furthermore, self-efficacy is recognised as a global construct in 25 countries including the Arab nation (Scholz, Gutierrez-Doña, Sud, & Schwarzer, 2002). Factors affecting self-efficacy include: previous experience, modelling of others, social persuasion, the personal interpretation of psychological factors (Bandura, 1997), gender, ethnicity, students’ academic ability and academic environment (Usher & Pajares, 2008). Self-efficacy is essential to accomplish any task, which reflects its importance in the demanding medical and dental educational environments. Moreover, self-efficacy is considered an important factor to facilitate students’ learning and engagement (Linnenbrink & Pintrich, 2003). However, self-efficacy is similar to life satisfaction in that it is not well investigated in the medical and dental literature in comparison to depression, anxiety, or stress. The following section highlights the literature findings in regards to the importance of self-efficacy among medical and dental students. It also shows the trajectory of changes across time, and the effect of gender on self-efficacy levels.

A study which used path analysis of data from a sample of 357 medical students in Iran found that self-efficacy had a large impact on the overall medical students’ psychological health (Kareshki & Parkmehr, 2011). Moreover, another study in Malaysia found self-efficacy to be a mediator to improve depression among medical students (Mukhtar & Hashim, 2010). Also other studies on medical students found self-efficacy to be in a significant inverse relationship with depression (Mustafa, Nasir, & Yusooff, 2010), anxiety (Zhu et al., 2011) and fatigue (Wei, He, & Sun, 2012). This illustrates the importance of self-efficacy as an indicator of the health and psychological health precisely among medical students. There is no study which investigates self-efficacy among Saudi medical students.
Self-efficacy is a strong predictor of dental students’ overall health-promoting behaviours (K. Peker & Bermek, 2011). Self-efficacy has been found to be one of the strongest contributing factors for stress among 571 dental students in Greece (Polychronopoulou & Divaris, 2005). In the previous study, the authors compared the contribution of different factors to stress, such as faculty administration factors, workload, patient treatment factors, performance pressure factors and self-efficacy factors. They found that self-efficacy had the closest association with stress in an inverse manner. In fact, these results were also found when stress and self-efficacy were investigated in multiple European countries simultaneously (Polychronopoulou & Divaris, 2005; Polychronopoulou & Divaris, 2009). This again is indicative of the importance of the self-efficacy construct among dental students, and justifies the author’s investigation in this thesis. Self-efficacy also has not been well researched among Saudi dental students, except in one study as a secondary result (Al-Sowygh, 2013).

Self-efficacy not only affects the psychological health of medical and dental students, but also affects the educational process of students. High self-efficacy was found to be associated with a deep learning approach, while low self-efficacy was associated with superficial learning among medical students (Papinczak, Young, Groves, & Haynes, 2008). Furthermore, Mustafa et al. (2010) explained that medical students with low self-efficacy might be vulnerable to the heavy workload in the medical curriculum. This was supported by a study that found self-efficacy to be associated with medical students’ academic performance (Chemers, Hu, & Garcia, 2001). However, this was not consistent with another study that found no relation with medical students (Mavis, 2001). This inconsistency might have been a result of conducting the studies upon different student academic years (1st vs. 2nd) in different institutes, or because the researchers used different measurement tools.

When studying the trajectory of self-efficacy among medical students across the same year or in different years, the literature was found to be insufficient. However, some dental studies investigated these points. Polychronopoulou and Divaris found self-efficacy to fluctuate over the academic year differently between male and female dental students (Polychronopoulou & Divaris, 2009). The fluctuation did not follow a specific pattern, and the reason for that was not investigated or justified. Furthermore, Alzahem et al.’s systematic review indicated that self-efficacy of dental students decreased in the transitional clinical year, the new challenges affecting their academic performance as well as their psychological health (Alzahem et al., 2011).
In regards to gender affect, male medical students were found to have higher self-efficacy than females in a number of studies (A. S. Khan, Cansever, Avsar, & Acemoglu, 2013; Wei et al., 2012). This was in contrast to a study where female dental students were found to have higher self-efficacy (Polychronopoulou & Divaris, 2010). This was supported by another study in Saudi Arabia (Al-Sowygh, Alfadley, Al-Saif, & Al-Wadei, 2013). However, these results might be criticised because self-efficacy was not measured by an independent tool, but rather was measured as a sub-domain in another tool that aimed to evaluate environmental stress on dental students. Nevertheless, no other studies present data opposing this finding. This indicates other areas for future research.

To sum up, self-efficacy was found to be an important construct indicative of medical and dental students’ psychological health. Many studies among medical and dental students indicated the association of self-efficacy factors with other forms of psychological distress. Some studies indicated its influence on students’ academic performance, but more evidence is needed. Few studies investigated the self-efficacy trajectory and it seems that the transitional year into clinic lowers dental students’ self-efficacy. Female medical students seem to have lower self-efficacy, while no gender effect was found among dental students. Nevertheless, self-efficacy is not well investigated in studies of medical and dental students, especially in the Saudi population. Further investigations are needed to fill in gaps in knowledge as has been discussed.

**Academic Performance and Psychological Health**

Many studies have indicated that the academic environment of medical and dental schools is considered the main distressing factor (Alzahem et al., 2011; Dyrbye et al., 2006). In fact, students’ competition for higher grades was found to be a considerable source of stress among medical and dental students (Mane et al., 2011; Shah, Trivedi, Diwan, Dixit, & Anand, 2009). A study found that the strongest indicator of depression among medical students in the preclinical year was study difficulties (Baldassin et al., 2012). In Saudi Arabia, performance pressure was found to be a considerable source of stress among Saudi dental students (Al-Sowygh et al., 2013). This demonstrates how the academic environment is associated with medical and dental students’ distress.

Furthermore, it was suggested by some studies that students’ distress negatively affected their academic performance, which was usually measured by students’ grade point average (GPA). In terms of depression, academic performance was negatively associated with depression among
medical students (Roh et al., 2010; Yusoff, Esa, Mat Pa, Mey, & Aziz, 2013). This type of relation was not investigated among dental students. Regarding anxiety, academic performance was associated with anxiety among medical students (Farooqi, Ghani, & Spielberger, 2012; Yusoff, Esa, et al., 2013). Only one article was found studying dental students and this found that though anxiety levels were elevated during examination time, this anxiety level was not associated with students’ academic performance (Brand & Schoonheim-Klein, 2009).

Stress was the most investigated construct in relation to students’ academic performance in contrast to depression and anxiety. As regards medical students, the literature was not consistent as two studies found an association between high stress and low academic performance in first year medical students in Malaysia (Yusoff, Esa, et al., 2013) and India (Sohail, 2013). In contrast, two other studies found no association between stress and academic performance in Thailand (Saipanish, 2003) and Saudi Arabia (Abdulghani et al., 2011). Nevertheless, Saipanish’s study measured the academic performance by perceived questions and not by actual students’ grades. Also, Abdulghani et al. used the Kessler Psychological Distress Scale (k10) (Kessler et al., 2002), which is a scale used to screen distress in general and is not specifically designed to measure stress. In regards to dental students, the literature was more consistent as high stress was associated with students’ low academic performance in two cross-sectional studies (Al-Saleh et al., 2010; Sanders & Lushington, 2002) and another cohort study (Silverstein & Kritz-Silverstein, 2010). This illustrates that medical and dental students’ distress is a potential factor that leads to low academic performance.

Although self-efficacy was found to be in direct relation to students’ academic performance in a systematic review article (Multon, Brown, & Lent, 1991), some recent researchers have found no such association among medical students (A. S. Khan et al., 2013; Mavis, 2001). A. S. Khan et al. illustrated that this was because the medical educational training that contains clinical practice and critical thinking in different contexts might be different from that of other medical educational training. A. S. Khan also highlighted that academic performance was a complex outcome based on students’ knowledge and skill in addition to other mediators and not only self-efficacy. It should be noted that the relation between self-efficacy among dental students and their academic performance was not investigated specifically, and no such studies among Saudi population have been conducted. Furthermore, no study was conducted to investigate the relation between students’ academic performance and satisfaction with life among medical or dental students, which leaves this an unanswered research question.
In general, psychological distress and academic performance were found to be associated in many studies among medical and dental students. However, different constructs might have a different consistency of results in either medical or dental students. On the other hand, self-efficacy was not found to be associated with medical students’ performance. One important point to note was that although most studies measured academic performance by students’ GPAs, this method might not be appropriate for senior students. This is because GPA is a cumulative record of students’ grades for all previous years. Thus, it would be more revealing to measure students’ year or term GPAs. This way, the measured psychological status would be tested for its association with the concurrent student performance. Also, it should be noted that most of the previous studies were cross-sectional in design, which suggests different potential directions for the relation between psychological distress and academic performance. This point is critical as it affects students’ educational outcomes and their health.

Summary

The depression, anxiety and stress among medical and dental students seems to be worse than in the general population, but dental students’ levels were worse than those of medical students. The prevalence of depression, anxiety and stress was found to vary by country. However, Saudi Arabia had a high prevalence of depression, anxiety and stress relative to other countries. Although there are differences in the changes in the levels of depression, anxiety and depression-across-time within the same academic year, it seems that students in general have lower levels of distress at the beginning of an academic year, and these levels peak at examination time. The effect of academic year, gender and financial status is documented, but each varies in accordance with the way the construct is measured and also by faculty. However, it seems in general that the transitional year is most stressful, and that female students are more distressed than others. It should be noted that the Saudi literature was identified as having numerous gaps in knowledge, and this has been discussed throughout the chapter.

In terms of the positive aspects of psychological health, the medical students seemed to be less satisfied than their peers and their level of satisfaction seemed to decline as the students moved toward their senior years. On the other hand, the transitional year seemed to be characterised by lower self-efficacy of students. The effects of gender, marital status and other factors were not consistent, but rather, were influenced by the construct and the faculty as discussed above. It should be mentioned that no Saudi study investigated satisfaction with life and self-efficacy as a main
question among medical and dental students. Finally, the academic environment was found to affect the psychological health of medical and dental students, and this seemed to affect students’ academic performance. Thus, psychological health is an important topic and more research is needed to fill the gaps in knowledge.
Chapter 3. Literature Review Part II: Self-Development Coaching Program (Study 1)

Title: Towards Understanding Self-development Coaching Programs.


*International Journal of Psychology and Behavioral Sciences:* is a peer reviewed journal; 5-years Impact Factor: not available

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Contribution of authors: The candidate is the primary author of this study, and was responsible for reviewing the literature and writing the manuscript. The second and third authors were the candidate’s supervisory team and they provided feedback and valuable input on the initial draft of the manuscript.

Implications to the thesis:

The present study provides a literature review of self-development resources and programs. The review explains that self-development resources are very popular and have high market value, however, little scientific literature has investigated self-development programs or their benefits for, and risks to, the target population’s health and safety. It shows that self-development programs aim to improve individuals’ lives in many aspects, despite this not currently being clearly defined. The review also adds that there are very few empirical studies presenting promising results on the psychological health of participants upon attending such programs. Such publications are few in number to as yet draw strong validation for such programs.

Moreover, the review shows that self-development programs seem to share some features with well-established terms in literature such as coaching, training, and mentoring. The review
explains that coaching may be the closest term to self-development programs. The review also proposes a new definition for *self-development coaching program*. It was indicated in this study that this proposed definition is considered an attempt to develop a definition, one which needs further development by scholars. This review is important in understanding the nature of the intervention to be evaluated in this thesis.

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The following is the format for the required declaration provided at the start of any thesis chapter which includes a co-authored publication.

The authors listed below have certified* that:

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2. they take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;
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Principal Supervisor Confirmation

I have sighted email or other correspondence from all Co-authors confirming their certifying authorship.

Xiang-Yu Hou

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Towards Understanding Self-Development Coaching Programs

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Abstract: Self-development resources are a popular billion-dollar industry worldwide used to improve individuals quality of lives. However, there are insufficient studies for a contemporary conceptualization, especially when it comes to live self-development programs. This paper provides a literature review about current self-development definitions, ideology, concepts, and themes; quality of material provided; quality and characteristics of self-development providers; and the features of the participants who seek such programs. The paper will also discuss the relationship between self-development and related disciplines including coaching, training, mentoring, and motivational speaking. Finally, a new definition will be proposed for self-development coaching programs. Gaps of knowledge are highlighted for further research.

Keywords: Self-development, self-help, human-development, coaching, motivational speaking, psychological well-being

1. Introduction

The emergence of self-development books and live programs has been documented since the 1950s [1]. The spreading of this industry is still documented in recent publications [2], but has not yet been investigated in-depth [3; 4]. Self-development is often presented as face-to-face course which can be called self-development live programs (SDLP). Despite the low number of research studies on SDLP, they merit being investigated because of the following. The magnitude of the growing self-development industry has been estimated to be worth billions of dollars [5; 6; 7]. SDLP providers are phenomenally popular and their SDLP course fees range between $1,200 to up to $3,990 U.S. per person [8]. Anthony Robbins, as an example of SDLP providers, today conducts his programs world-wide [9; 10] and has influenced high-ranking, authoritative leaders such as
former U.S. president Bill Clinton and the last president of the Soviet Union, Mikhail Gorbachev [9; 11]. Furthermore, promotional claims accompanying SDLP require critical evaluation. For example, Grant critiqued Robbins’ claims [12] that promise immediate individual’s life improvement as being unproven, psychologically unethical, and perhaps not effective for different population types [13]. More importantly, some catastrophic documented cases of self-development practices should be taken into consideration—for instance, the suicidal case in Sydney Australia of a participant after attending SDLP [14]. Also such case is in the U.S. with a famous SDLP that ended with three participants dying and eighteen being hospitalized [7].

Thus, it is crucial to present this literature review on self-development practices, its effect on quality of life, and identify the gaps in knowledge for future scientific contribution. This paper discusses current definitions, content, providers, main target populations, and impact of SDLP. Any other forms of self-development such as self-development via electronic media or video are beyond the scope of this paper. Furthermore, a brief discussion will try to position self-development among coaching, training, mentoring, and motivational speaking contexts. Finally, a proposed definition for SDLP corresponding with the literature review will be presented as an attempt to understand SDLP.

2. Methodology

This review was done by searching electronic databases to find relative literature. We searched Queensland University of Technology electronic library, Science Direct, PubMed, and Google scholar for peer-reviewed articles and books on self-development programs since January 1990 up to January 2014. The reference lists in primary sources were also searched for relevant articles. Other commercial websites of self-development and newspaper articles on self-development were only used to provide examples of support. Searched terms used combinations of self-development, self-improvement, self-help, coaching, mentoring, training, motivational speaking, course, program, books, psychological health, mental health, quality of life, and improvement. Due to scarcity of scientific articles, all resources on self-development written in English were eligible in this review, but only relevant literature were included. The articles investigated self-help activities administrated by psychologists or psychiatrists were excluded. Self-development via electronic media or videos were also excluded.
3. What is self-development?

There is variability among self-development terms and definitions in the literature along with an overlap with other disciplines. The term “self-development” is not the common used in literature. Instead, self-development has been expressed by different terms such as self-help, self-improvement [5], self-help resources [15], self-help, self-guided improvement [16], public self-help [17], and self-development [18]. All these terms were used in the literature without an agreement on a unified term.

Self-development also has different definitions. For instance, the APA Dictionary of Psychology defines self-help as "a self-guided improvement economically, intellectually, or emotionally often with a substantial psychological basis" and explains that self-development activities aim to improve aspects of life that professionals do not typically apply themselves to, such as: friendship, identity, and life skills [16]. This definition illustrates that self-development aims to improve individuals in different areas, but fails to distinguish self-development from other disciplines by providing details on ways of delivery or the providers.

Another definition is "adopting book or computer CD-ROM formats…based upon many of the principles and techniques incorporated within conventional psychological therapies, with many of the more recent self-help resources adopting a cognitive-behavioral or problem-solving approach" [19]. This definition extends the scope of self-development into a psychological therapeutic spectrum resulting in an overlap between self-development and bibliotherapy, which is a psychological treatment approach using guided reading as a therapy and written by psychologists.

In fact, a number of authors illustrate the necessity of differentiating the commercial self-development books and materials from other psychological treatment terms [20; 21] and other disciplines such as coaching [22] so as not to mislead clients. These limitations raise the need to review literatures upon different aspects of SDLP and to compare it with similar disciplines for better conceptualization as the following.

4. Self-development content

To understand self-development, its ideology and concept, themes and the quality of materials provided should be discussed. In 2004, a study investigated a self-development book, If Life is a Game These are the Rules [23], and found that self-development books use a combination of holistic life view and spiritual ideology characterized by secular spiritual attitudes that tend to
make individuals concentrate on "the self" [24]. Other studies indicated that some self-development materials were derived from cognitive behavioral therapy concepts [13], Neuro-Linguistic Programming (NLP; Robbins, 1997), and positive psychology [25]. Accordingly, self-development multiplies suggested to have variable ideologies and conceptual frameworks, which makes the researcher’s task more difficult to investigate in depth. However, and though the diversity of these concepts and ideologies, they all aim to promote personal improvement to the client.

A qualitative study of 57 best-selling self-development books identified five main themes—personal growth, personal relationships, coping with stress, identity and miscellaneous—that included different topics such as study skills for students, hypnosis, communication skills, and dealing with depression [25]. In another study, 134 self-development readers in Canada were found to use self-development mainly to improve their health and well-being in addition to interpersonal skills and personal-career [26]. This study’s findings coincide with the overall earlier definitions of self-development as both used a wide range of life areas to improve individuals' lives including the health aspects. Nevertheless, these studies did not specify very precisely how this improvement takes place, the attitude of each theme, or even provide a unified model. It is rather suggested that each self-development book or program adopt the writer or the provider’s perspective.

From another perspective, the validity of the materials presented as scientific evidence in SDLP are questionable [27]. There is some literature that indicates a mixture of intact and quality information, unproven or misleading content. For example, Grant (2001a) investigated the scientific background of the six steps of Neuro-Associative Conditioning (NAC) which is a technique used by Anthony Robbins. Grant found that four steps have roots in philosophical or cognitive behavioral therapy (CBT) concepts. However, the other two steps are not yet proven. An example of misleading information is when The National Council Against Health Fraud critiqued the 10th chapter of Robbins's book [12] and argued that it contained many misconceptions and half-facts about diet, eating, and food [28]. This indicated that the material presented within self-development books or SDLP to improve lives or health are not critically evaluated, and need further research investigation especially for the other books and programs than might have influence on population levels.

It is also important to emphasize that the previous examples are derived from literature about self-development books whereas such investigations on SDLP were not specifically found. Nevertheless, it can be suggested that SDLP shares the above-mentioned features for the following reasons. It can be observed from famous self-development coaches' websites, brochures and
advertisements that the content of self-development books and live programs are alike because the books' authors are the coaches/trainers of their own self-development courses such [12] who used the content of his books in his self-development programs [13]. Thus, it is suggested that self-development books and live programs have the same structure. However, there is a need for more structural qualitative and qualitative studies to investigate SDLP contents specifically.

5. Self-development providers

The following section will discuss self-development providers' backgrounds and their characteristics. An analysis of the literature indicates that self-development providers' backgrounds and qualifications are not clearly discussed by authors and are sometimes deceptive. Fernros's describes the self-development program provider in his study in Sweden as a specialist according to the provider’s reputation and life-long expertise only in facilitating this program [29]. In another study on another program in Australia, the authors neglect to illustrate the local leader’s credential or characteristics [30].

It is also reported that commercial self-development authors use irrelevant Dr. and PhD titles to situate themselves as experts and to add credibility to their works [4]. These examples indicate the presence of self-development writers, coaches, or providers with questionable qualifications in relation to the materials they present.

Moreover, SDLP provider characteristics are highlighted as an important factor for the program's effectiveness [27]. This was indicated by Several authors indicated for a number of these characteristics includes being famous, having a good reputation, and being seen as an authority brands self-development providers as experts in their field [31], even if that is not true [32]. In addition, empathy [33; 34], confidence, using the provider's personal experience [34], persuasiveness [7; 25], the ability to get the audience’s attention [35; 36] and the ability to influence clients' emotions [37] are all highlighted as characteristics for successful self-development providers. Two other factors were highlighted by the coaching literature which are acting as a role model and increasing the motivational level for participants [38], which can also be included as important features.

Other characteristics of the SDLP itself can influence the program's outcomes such as the program's relevance to the coachee [39], the coachees having experience with the programs contents [40], and their level of satisfaction [41]. These characteristics, were reported scatteredly in the previous studies and did not receive valuable attention as susceptible contributing factors to
such programs’ outcomes, and have only investigated empirically in one solo pilot study where the author indicated that self-development coach characteristics rating, by participants, was above the normal average rating of the normal population [42]. This encourages to investigate theoretically and empirically the different characteristics that may play a vital role in such programs’ effects.

The role of SDLP providers constitutes a knowledge gap of in that it is not significantly discussed in literature. However, it is observed that SDLP providers teach the program materials, facilitate the exercises, and interact with participants employing the discussed characteristics to achieve individual development and improvement.

6. Self-development participants

Reviewing the literature indicates a number of specific features of people who attend SDLP. Fernros et al. (2005) found that people who attend the program score poorer in all quality of life and emotional well-being subclasses when compared to the general population. Moreover, the authors found a significant association between emotional health and program enrolment, implying that the lower the emotional health, the greater people intention to attend and fund themselves for these programs. This association can be explained by attendees’ desire to improve their well-being, which flows logically with the self-development’s main intention—to improve an individual’s life.

However, this finding might not apply to everyone attending such programs. For instance, people might attend as part of a luxurious lifestyle as has been found on an organizational scale in relation to developmental programs [43]. Such contradictory information widens the horizon to conduct more research on clients' intentions and motives for attending and paying for such programs.

On the other hand, other literature revealed some concrete demographic features of people attending self-development programs. In relation to gender, females have a more positive attitude toward self-development books [44] and programs [7; 45] in the U.S and Australia. This finding is coincidence with the previous statement of clients with low quality of life, as females usually have a poorer quality of life compared to males [46; 47].

From an educational point of view, Fernros et al. (2005) also found that the programs’ attendee were at twice the national educational level of the population. Conversely, a recent study in Austria found that educated people are less prone to take action from self-development to improve their lives [2]. This controversial finding might be explained by the diversity of self-development
programs and providers’ characteristics whereby each program and provider can target a specific type of population and reflect another gap in knowledge.

7. The empirical impact of SDLP on quality of life

According to our knowledge, only two studies investigated the commercial SDLP empirically whereas some investigated other SDLP that were designed for research purposes only. Fernros (2008) investigated the effect of a SDLP which has been presented since 1985 empirically with control group in Sweden. The program included exclusive techniques, bodily exercises, reflection, meditation, birth exercise, death exercise, freedom exercise, and bully-victim roles. Fernros found a significant improvement in the sense of coherence and in most of the health related quality of life domains including emotional well-being, emotion, pain and sleep.

The other one was a pilot study that was conducted on 17 medical students in Saudi Arabia empirically using SDLP of study skills that has been used since 2008. The study found significant improvement in depression, self-efficacy, and life satisfaction [42]. These results encourage for more investigation for the other programs because these results are not enough to validate such programs especially when there are a wide varieties of SDLP.

8. Self-Development Live Program in relation to other research constructs

When investigating self-development, it is very important to discuss self-development in comparison to other terms in the literature for better understanding and to avoid overlap with other disciplines. The second section of the paper will discuss briefly the relation between SDLP and coaching, training, mentoring, and motivational speaking. Coaching will be discussed in more detail as it is most similar to self-development in regard to its definition, aims, approaches, types, and content, and its relation to self-development. Training, mentoring and motivational speaking will be discussed briefly in terms of self-development. It should be highlighted that there is a great overlap between coaching, training, and mentoring [48]. Despite differentiation efforts, the boundaries are still hazy and part of an ongoing argument. Moreover, training, coaching, and mentoring share the same concepts and are typically seen as interchangeable elements of a learning process [49]. This might make the comparison more complex, but the discussion in this paper will try to position self-development in the arena of research with more comparable manner.
8.1. Self-development versus coaching

8.1.1. Definition

Coaching could be the field closest to live self-development programs. To illustrate that, it is important first to provide a brief overview. Coaching is a term that has emerged recently in the research arena with consistent efforts to develop a related body of knowledge [48; 50].

Coaching definitions varies from author to author with some variability [48; 49; 51]. Cox and colleagues in their seminal work, The Complete Handbook of Coaching, defined coaching as "a human development process that involves structured, focused interaction and the use of appropriate strategies, tools and techniques to promote desirable and sustainable change for the benefit of the coachee and potentially for other stakeholders" [48]. Though Cox and colleagues explained that their definition is not completed yet, it can be considered the best-published definition. Other definitions, in Table 1, add that coaching also aims for immediate change or improvement in the performance, development, learning, life experience, and personal or professional growth. Thus, SDLP apparently coincides with coaching’s aim to improve and develop individuals multidimensionally.

Table 1. Coaching Definitions

<table>
<thead>
<tr>
<th>Coaching definition</th>
<th>author</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Unlocking a person’s potential to maximize their own performance. It is helping them to learn rather than teaching them.&quot;</td>
<td>[52] (p.8)</td>
</tr>
<tr>
<td>&quot;Directly concerned with the immediate improvement of performance and development of skills by a form of tutoring or instruction.&quot;</td>
<td>[53] (p.18)</td>
</tr>
<tr>
<td>&quot;The art of facilitating the performance, learning and development of another.&quot;</td>
<td>[54] (p.15)</td>
</tr>
<tr>
<td>&quot;A solution-focused, resulted-oriented systemic process in which the coach facilitates the enhancement of the coachee's life experience and performance in a domain determined by the coachees, and fosters the self-directed learning and personal growth of the coachee.&quot;</td>
<td>[55]</td>
</tr>
<tr>
<td>&quot;A human development process that involves structured, focused interaction and the use of appropriate strategies, tools and techniques to promote desirable and sustainable change for the benefit of the coachee and potentially for other stakeholders.&quot;</td>
<td>[48] (p.8)</td>
</tr>
<tr>
<td>&quot;A collaborative relationship formed between coach and coachees for the purpose</td>
<td>[50] (p.126)</td>
</tr>
</tbody>
</table>
of attaining professional or personal development outcomes which are valued by the coachee.”

8.1.2. The coach and SDLP provider

The coach’s role is considered an integral core value of the coaching process as the coach facilitates, guides, and helps the coachee toward self-direct learning [52; 55]. However, other authors in Table 1 mentioned different roles and approaches including "tutoring," "instructing," "helping," "interaction," and "collaborative relationship." These roles reflect that coaching is a broader concept than just facilitation, and reveal an unresolved argument on the coach’s role by different key authors.

An interesting explanation for this agreement is proposed by Cavanagh, Grant and Kemp [56], who indicate that the coach facilitates self-directed learning but can also move into a "teaching" mood when appropriate. This notion corresponds with a number of interventional studies where coaching involves informative sessions in addition to the facilitation process [42; 55; 57; 58]. In contrast, SDLP can be considered mainly informative and teaching conjugated with facilitation process, i.e., both coaching and self-development take the approach of facilitating and informing, but with different grades as in figure 1.

**Figure 1.** The overlap between self-development live program and coaching approaches.

Another comparable point to discuss is that the coach is not required to be an expert in the field in which he/she helps the coachee to improve [50]. On the other hand, while self-development providers share the same flexible requirements, the providers are recognized by participants as expert, trusted, and successful.

Moreover, Grant O'Hara [59] stated that "qualification," "accreditation," and "certification" terms are used frequently in the coaching industry without clarity in Australia. In fact, the coaching
industry has been criticized by being full of pseudo-qualifications and pseudo-accreditation or self-accreditation [60; 61]. Community ignorance about misleading titles underpins the deception process in the coaching industry [60], where coaches vary in degree of openness about their qualifications [59]. Grant stated that only half of the coaches are in fields possess qualifications directly relevant to coaching [59]. However, this is an overestimated percentage as Grant considered any PhD (regardless of field) and arts qualifications as direct academically relevant qualifications for coaching.

This picture reflects the current unclear and chaotic status of coaches that is similar to that of SDLP providers. It is suggested that these two studies by Grant and his colleagues in Australia describe the overlap among self-development, coaching, and training activities. This overlap is fostered when considering that “coach” is a common term used by SDLP providers internationally such as Anthony Robbins [62] and Les Brown [63]. This similarity indicates a common entity between self-development and coaching in real practice in the world.

8.1.3. Content

There are three aspects that will be discussed here to further compare between coaching and self-development: concepts, themes, and the quality of material provided. Coaching ideology is seen to be derived from the Western culture in the process of pursuing self-centered goals and values [64], while some self-development also has a self-centered attitude in addition to holistic life ideation as discussed earlier by Fernros et al. This reflects that self-development tend to conjugate somewhere in the spiritual dimension regardless of its being subject to science.

Moreover, Cox and colleagues discussed 13 concepts used in coaching, which are: psychodynamic, cognitive behavioral, solution-focused, person-centered, gestalt, existential, ontological, narrative, cognitive-developmental, transpersonal, positive psychology, transactional analysis, and Neuro-Linguistic Programming (NLP) approaches [48]. The authors illustrated that these are not the only concepts or approaches and critiqued other authors who exclude some approaches that they are not familiar with.

In this context, the standard self-development live program approach is not very clear, as it rather depends on the provider’s style in conducting the program. However, NLP, positive psychology and CBT concepts have been reported to be used within SDLP. This ambiguous information results from the fact that coaching research tends to outline and articulate its theoretical
frameworks and approaches, while the self-development field is seen as being more chaotic and commercial practice.

In 2010, Grant indicated that the principles of coaching allow it to be applied to any field desired by the client in order to achieve goals in any field. However, this notion does not correspond with the classifications of skills and performance, developmental, executive and leadership, managerial, team, peer, career, and life coaching as themes of improvement [48]. This classification shows how coaching is directed into specific fields more than being applied to any field. Furthermore, authors in the field explain that coaching concepts come from other disciplines such as psychology, education, behavioral sciences, clinical counseling, teaching, workplace training, learning and development, management and economics because coaching is a new field that uses other disciplines' concepts [56]. Indeed, this indicates that coaching might be directed within different contexts and themes. On the other hand, self-development themes, as discussed before, have different nature of classification into specific topics that focuses more on individual perspectives.

Nevertheless, the life coaching concept is more similar to SDLP, as life coaching concerns with the individual to improve performance, well-being, and to achieve goals [22]. It is also interesting to note also that life coaching started as a commercial coaching in the 70s and 80s [22]. However, some observed that SDLP is directed toward other themes of coaching such as leadership and management, which indicates that SDLP and coaching are not contradicting in this point.

From another perspective, and despite the rigorous efforts done by some author to move coaching into evidence-based practices [51; 56; 65; 66], achieving evidence-based coaching has a very long way to go and needs efforts to adopt from other disciplines [22]. For instance, NLP has been highlighted as a very popular approach used by coaches [67]. Grimley discussed NLP as a model that emerge from Richard Bandler and John Grinder and their observations, where a current effort is conducted to find the scientific frameworks behind it and to evaluate it more critically. However, a recent systemic review concluded that there is only little evidence to support the effectiveness of NLP [68]. In other words, it is common to find un-evidence based approaches in coaching and not all coaching in practice are evidence-based.

In the same manner, self-development contains knowledge from other disciplines and not all the information provided is scientifically proven as discussed before. It is relevant to remind that SDLP use also NLP concepts as well. Thus, the main difference here might be that coaching
scholars are conducting rigorous efforts to move coaching to be an evidence-based practice, while self-development providers are not so concerned with this.

It can be concluded that self-development and coaching sharing many aspects, though researcher try to distinguish coaching with a number of boundaries. Coaching can be viewed as the new scientific movement of the current unorganized practices in the commercial world of SDLP, as coaching is sharing multiple aspect and root within SDLP. Thus, this paper proposes considering SDLP as a theme with specific features among the coaching themes and call it self-development coaching.

8.2. Self-development versus Training

Self-development shares some features with training, but some of these features overlap with coaching as well. The following part will discuss briefly the main points.

Training is defined as "learning that is provided in order to improve performance on the present job" [69]. Another definition is "any organized activity that is designed to bring about change in an employee's on-the-job-skills, knowledge, or attitudes to meet a specific need of the organization" [70]. Training is considered as a part of technical vocation or as an organizational-developmental process for employees [71]. Also, the main aim of training is inducing an organizational change by improving an individual’s competency to the required level [72]. This illustrates that training is more organizational-centered, through this is achieved by changing individuals to develop the organization competency. On the other hand, self-development is client-centered mainly, even if that extended secondary to the organization benefit as explained earlier. This can result in different individual desires, attitudes, relevance and scope of change between trainee and self-development participants.

From another perspective, Grant (2001b) tried to differentiate between coaching, mentoring, and training. He stated that training is more rigid and demands trainees to adjust themselves to the training process and the course, whereas coaching is more flexible and could be adjusted to coachee interest. According to the previous statement, self-development is considered more relevant to training as self-development usually has a pre-designed program concerning specific topics to which the participants need to adjust themselves.

However, it is very important to notice that this explanation by Grant does not mean that the current coaching approach is isolated from the training approach. As explained earlier, coaching
empirical studies involved "informative" fixed activities besides coaching [57; 58]. This can be understood in the context of the overlap between coaching and training [48; 49]. In addition, self-development usually has more room for freedom for the participants to use the provided material or not, and usually is not followed by assessments such as in training [73]. Thus SDLP is in the middle of the rigidity of training and the flexibility of coaching.

Another interesting point is that SDLP outcomes can be categorized into knowledge, skills, and attitude according to McArdle's definition of training and Kraiger’s model of training outcomes [73]. This is because SDLP provides information (such the importance of goal setting), strategies (such as SMART technique for goal setting), and values (such as being proactive). However, this does not mean that SDLP is exclusively a training concept, because many educational processes, including coaching and mentoring, can include these outcomes. In fact, these outcomes are the same as those of Bloom’s Taxonomy [74] of the general educational activities which are cognitive, affective, and psychomotor. Nevertheless, this addition could be useful to understanding SDLP, because training is a more mature discipline than SDLP that needs to develop strong theoretical frameworks.

The previous section illustrates that SDLP shares the program's pre-designed feature with training and can be explained by Kraiger's model of training. However, this feature is sometimes seen as overlapping with coaching as well. SDLP has both coaching and training features, yet is more liable to be categorized under the coaching umbrella due to the several common factors.

8.3. Self-development versus mentoring

Mentoring is defined as "an interaction between at least two people, in which the knowledge, experience and skills of one or both are shared, leading to growth and self-understanding" [49]. In addition, mentoring can be characterized as informal relationship between two person where the mentor is more knowledgeable than the mentee [75]. This does not follow with the general self-development practice where SDLP is not one to one relationship occasionally.

Furthermore, Law and colleagues (2007) illustrated that mentoring is a long-term relationship with the mentee [49]. When it comes to self-development it is more likely to be a short-term relationship that varies from days with famous providers up to months in some programs [18; 29]. This is considered to be the second major difference between self-development and mentoring, and is seen as another shared feature with coaching as coaching is also a short-term relationship [49].

Nevertheless, a mentor is required to be a senior or a very experienced and knowledgeable person in the selected field [55; 76]. This point is similar to self-development providers who are recognized or acknowledged in the field. Therefore, self-development provider is closer to mentoring in this point.

Thus, it is suggested that self-development again shares some features with mentoring but does not follow mentoring notions in general, fostering the idea that SDLP is more relevant to a coaching concept. It is worth mentioning that SDLP is observed to sometimes transfer into a one-to-one mentoring relationship, but not as a common trend.

8.4. Self-development versus motivational speaking

Motivational speaking is another common commercial description to SDLP. However, motivational speaking as a term is barely mentioned in scientific literature. Instead, public speaking is the term commonly used, which is defined as "a sustained formal presentation made by a speaker to an Audience"[77]. In fact, motivation is seen as one feature of an effective public speaking when combined with informing, influencing, persuasion, leadership, mass communication, and customer service [78]. Thus, it is better to discuss SDLP in relation to public speaking as a term rather than the common, but incomprehensive term of motivational speaking.

As previously mentioned, public speaking and SDLP share some features but differ in others. SDLP's implementation aligns with public speaking's definition in general. However, the formal presenting style of public speaking can be extended in SDLP into interactive activities and exercises during the program. Also, public speaking and SDLP share some features such as motivation, informing, influencing and persuasion, while not sharing other features. For example, SDLP does not always necessitate mass communication as the program can be conducted on small number of participants.

Furthermore, SDLP has an integral aim of improving individuals' lives, whereas public speaking can be employed for other aims such as politics or marketing speeches. SDLP also, can include more detailed knowledge and skills, such as goal setting strategies and exercises, to help the client induce change in contrast to public speaking. In fact, public speaking is seen as a skill or a form of communication rather than a discipline in comparison to SDLP or coaching. Thus, SDLP can include the features of public speaking fully or partially during the SDLP program, but SDLP is a larger interactive process than merely public speaking.
8.5. A proposed definition for self-development coaching program

According to this review of the self-development literature, we suggested a new definition of self-development and used it in a recent interventional study [42]. The self-development coaching program can be defined as a "short term interactive human developmental process, between coachees and a recognized and featured coach. This process aims to facilitate individuals' life improvement in knowledge, skill or attitude in fields valued by the coachee, which potentially extend to the organization. This is achieved by a mixture of concept and techniques derived from other disciplines and from the coach's personal experience delivered in a semi-rigid structured program." It should also be noted also that the word "self" in the term self-improvement indicates the flexibility and freedom of the coachee to use the material provided or not. This definition is characterized by flexibility in terms of the number of participants, program concepts, and coach's characteristics as these factors can vary from one program to another. Nevertheless, this definition can be used as a starting point for a further qualitative research to refine the conceptual identity of self-development coaching program when future literatures and theories are conducted and developed.

Adopting this proposed definition has three advantages. First, using the unified term of self-development coaching program amidst other disciplines' definitions will reduce the overlap while conducting research on these fields. This term aligns with the previous self-development definitions in addition to including more details about the aim, provider, topics, approach, and participants. The definition in this form also does not overlap with that of psychologist-led bibliotherapy. Further, the definition is similar to other coaching definitions [48; 50] but illustrates the importance of the coach’s characteristics, as discussed earlier, and highlights the variable quality of material provided in this type of coaching. This definition is differentiated from that of training as this type of coaching is client-centered and the structure of the program is not completely rigid. Finally, this definition shows that the self-development coaching program is a short-term process in contrast with mentoring.

Second, this definition will help coaching researchers to prevent overlapping research data between evidence-based coaching and the commercial self-development coaching program. This is important in view of the explicit efforts of coaching research to build a body of knowledge with scientific conceptual theories about coaching and tendency to avoid the commercial self-development coaching program. Third, this definition highlights this type of coaching in the

research area as a knowledge gap that needs researchers’ evaluation and critiques in light of its wide-spread use and market share.

9. Conclusion

Despite self-development's popularity and large industry, high costs, un-evidenced claims, and case-reports of its hazards insufficient publications and resources are found for comprehensive understanding and evaluating of the field. Current definitions were insufficient to provide an accurate description of self-development live programs (SDLP). The review indicated that some SDLP featured secular-spiritual ideation while some borrowed concepts from other disciplines. SDLP themes vary but aim to improve and develop individuals in different fields. The contents are a mixture of proven, unproven and sometimes misleading information. Providers are not always academically qualified, but rather are recognized by the clients and characterized by special characteristics that facilitate participants’ improvement. Moreover, people who attend SDLP might be characterized as having a poor quality of life or poor psychological health, or may simply aim to have luxurious experiences. Females have been found to be more open to self-development, whereas the findings on education level in relation to clients were inconclusive. Moreover, very few empirical evidences was found indicated to the significant improvement of participants’ quality of life, however, not enough to draw a firm conclusion.

When comparing SDLP with other disciplines, it is found that SDLP shares a number of features with coaching, training, mentoring, and motivational speaking. However, self-development can be considered a coaching category because both self-development and coaching are mainly client-centered and share the same aim of improving and developing individuals by facilitating and informing, they sometimes uses the same concepts, and are both short term processes. Though SDLP is a more rigid and fixed program such as in training, conducted by a knowledgeable provider such as in mentoring, and using the skills of public and motivational speakers, the concept of self-development is closer to coaching’s main features and suggested to be termed self-development coaching. Therefore, a new definition of self-development coaching program was proposed based on the previous findings. Nevertheless, and because of the scarcity of literature and the diversity of the self-development genre, this definition can act only as an initial attempt to define self-development coaching program as the definition need a critical evaluation when more literatures are developed.

The literature review reveals from the common and overlapping information that the self-development coaching program is the pre-research phase of the commercial coaching-training-
mentoring mixture. It is crucial not to isolate the current practice of self-development from the research arena. It is necessary to assess self-development coaching programs’ effectiveness and validity to be able to incorporate useful practices and omit pseudo or ineffective practices. This can provide vital practical data to help people attain a healthier and more satisfied life, which will in turn develop coaching science and also promote public health awareness and public policy development for eliminating deceptive and inaccurate practices in future.

The self-development coaching program also has room for flexibility to combine coaching, training, mentoring, and public speaking to improve individuals. This synergetic and realistic view of current practices can resolve the dilemma of the failed efforts to isolate these terms in research.

The major limitation of this paper is the scarcity of scientific publications on self-development coaching programs. This limited our attempt to provide an integrated discussion between different studies results. In fact, the current quantity and quality of literature in addition to the highlighted research gaps indicated for immature and insufficient body of knowledge to have considerable understanding to self-development coaching programs, and urge for further qualitative and quantitative research.

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Chapter 3. Literature Review Part II


Chapter 4. Methodology

This chapter describes the research design and methods used in this thesis. The emphasis is on the aims, objectives, research questions and significance of the thesis; and on the study’s design with a focus on population, sampling and sample size calculation. One section explains the thoroughness of the intervention and gives details of the variables. Another section illustrates the instruments used and the translation process. This chapter also explains the design of the questionnaire, the recruitment, data collection protocols, the research assistant’s team, and incentives. In addition, factors relating to: the intervention setting, cultural considerations, randomisation, blindness and setting adjustment, are included. The last part of this chapter discusses resources, funding, and research ethics. It should be mentioned that the published and accepted studies in Chapters 5 through to Chapter 8, have methodology sections which contain information which is reiterated in this chapter.

Study Design

Four study designs were used in this thesis, in addition to the literature review article (Study 1). A cross-sectional design was used to evaluate the psychological health of preclinical medical and dental students in Makkah, Saudi Arabia (Study 2, Chapter 5). Longitudinal study design (cohort) was used to assess the change in the students’ psychological health (Study 3, Chapter 6). Intervventional non-randomised study design and without control group, was used in the pilot study to assess the conductibility of the main interventional study, in addition to deriving an initial assessment of the effectiveness of the self-development coaching program among medical students (Study 4, Chapter 7). Finally, a parallel-grouped randomised controlled trial (RCT), placebo-controlled, partial-blinded design was used to assess the effect of the program on the main targeted population (Study 5, Chapter 8). It should be mentioned that STROBE statement guidelines (von Elm et al., 2007) for observational studies were followed during Study 3, and the CONSORT Statement guidelines (Schulz, Altman, & Moher, 2010) were followed during Study 5.
The Population

The following part discusses the population, sampling method inclusion, exclusion criteria and sample size calculation. It should be emphasised that the population and sampling for the pilot study (Study 4) was conducted separately from the main population for this thesis. Thus, the main population used for Studies 2, 3 and 5 will be discussed first, then, details of the pilot study will be discussed at the end of the population section.

The Main Population and Sampling

The main target population of this thesis is preclinical medical and dental students (in second and third year), Umm Al Qura University (UQU), Makkah in the Western Province in Saudi Arabia. The students from the academic years of 2012–2013 were approached. The population significance has been highlighted previously. UQU was selected because it is the only university that teaches medicine and dentistry in Makkah. Preclinical students were selected as the main population for this thesis because of these three reasons:

1) There is a considerable amount of research which has indicated the high levels of distress among preclinical year students relative to the other students in other years, as explained in Chapter 2.
2) Students in these years, which are the basic science years, depend heavily on study skills to achieve better academic performance, which is the main objective of the selected self-development coaching program. This is in contrast to the students in their clinical years, who depend heavily on clinical skills.
3) Students during these years have less experience with university and academic-life than have senior students, and they have more potential to benefit from such programs in comparison to clinical years students.

Participants were mainly sampled using selective, clustered, purposeful sampling from the targeted population. All students in second/third years, medical/dental, and male/female were invited. The number of invited students, their response rate, dropout rate, age, and demographic data were detailed in each study accordingly.

Participants’ Inclusion Criteria

1. Student in the second/third years in 2012–2013 academic year
2. Medical or dental student
3. Student from Umm Al-Qura University
4. Gave informed consent to participate in the study (Appendices B and C)

Participants’ Exclusion Criteria

1. Already attended “How to be an Ultra Super Student” program during his/her academic life in the university.
2. Has a major psychological or psychiatric disorder (on psychiatric medication or was visiting a psychiatrist for mental illness).

Sample Size calculation

Due to the fact that different study designs were used in this thesis, different sample size equations were used. For the observational studies (Studies 2 and 3, Chapters 5 and 6 respectively), the following formula of continuous outcome in a population and a two tailed hypothesis was used (Sullivan, 2011, p. 171):

\[ n = \left( \frac{Z_{1-\alpha/2} \cdot \delta}{E} \right)^2 \]

Where, \( n \) = number of participants
\( \alpha \) = type I error = 0.05
\( \delta \) = the standard deviation (SD) of a similar study.
\( E \) = margin of error

The \( \alpha \) value used is 0.05. The constant value of \( Z_{1-\alpha/2} \) = 1.96. To estimate the values of SD and E, they should be derived from a similar study that used a similar outcome instrument. One of the main instruments used in this thesis is the Depression Anxiety Stress Scale (DASS21) as will be discussed later. The SD of 10.6 was used as the most conservative (largest) value from a similar study (Yusoff, Mat Pa, Esa, & Abdul Rahim, 2013). A margin of error (E) of 2 units was used as the most conservative (smallest) difference between anxiety categories in DASS21. The previous number will be used as the multiplication factor. It should be noted that the above conservative values were used only in the calculation of the observational studies.

Thus, the minimum sample size required:
\[
= \left( \frac{1.96 \times 10.6}{2} \right)^2 = 107.9
\]

That is, 108 participants were needed in order to detect a difference in our observation study. For the cross sectional study, 108 was multiplied by 1.5, as a 50% non-response rate was expected, so this indicated that 162 participants should be invited. For the longitudinal study the number 108 should be multiplied by 1.5 (expected non-response rate) and another 1.5 for design effect, and this indicated that 243 participants should be invited.

For the RCT study, the sample size and effect size formula for two independent samples, continuous outcomes and two tailed hypothesis was used (Sullivan, 2011, pp. 181–183) as follows:

\[
n_i = 2 \left( \frac{Z_{1-\alpha/2} + Z_{1-\beta}}{\text{ES}} \right)^2
\]

\[
\text{ES} = \frac{|\mu_1 - \mu_2|}{\sigma}
\]

Where, \(n_i\) = number of participants per group,

\(\alpha = \) desired \(p\)-value = 0.05,

\(\beta = 1 - \) (study power \% \(\div\) 100) = 1 – (90/100) = 0.1,

\(\sigma = \) standard deviation (SD),

\(\text{ES} = \) effect size,

\(\mu_1 - \mu_2 = \) the minimal clinical difference (MCD)

The desired \(\alpha\) value was 0.05. The desired study power was 90\%, thus \(\beta = 0.1\). The constant value of \(Z_{1-\alpha/2} = 1.96\), and for \(Z_{1-\beta} = 1.282\). According to one of the well conducted RCT on coaching which used DASS21 (Grant, Curtayne, & Burton, 2009), the standard deviation of DASS21 subclasses ranged between 3.6 for the depression subclass and 10.39 for the stress subclass. Thus, the average standard deviation used in this equation was 7. Due to the self-development coaching program being a newly established field with limited resources, it was not possible to know the minimal clinical difference MCD, thus, a 4 points difference was used as 4 points could change depression, anxiety or stress levels from mild to moderate. Thus,
\[ ES = \frac{4}{7} = 0.571, \]

\[ n \text{ (per group)} = 2 \left( \frac{1.96 + 1.282}{0.571} \right)^2 = 64.31 \]

Thus, the required number to produce an appropriate statistical result was 65 in each group, that is, 130 for the study and control group.

As 130 participants was the minimum number of required participants, this number should be multiplied by 1.5 for the design effect of multiple follow up (50%), 1.5 for expected non-response rate (50%), and 1.25 for expected dropout rate (20%). Thus, the required number of students which should be invited = 130 \times 1.5 \times 1.2 \times 1.5 = 351 invitations.

It should be noted that despite there being two different sample size calculations, the thesis involved only one sample that was used in the observational and the interventional studies. However, these calculations were done to ensure that the number of participants to be invited to participate in the studies were enough to detect a statistical difference.

**Participants in the Pilot Study**

The participants in the pilot study (Chapter 7) were slightly different from the target population of this thesis. The pilot study used a convenience sample that was recruited from the fourth, fifth and sixth years of the medical faculty at UQU to participate in this interventional pilot study. Students were required to give informed consent to participate in the pilot study (Appendix D and E) and attend the interventional program to be eligible for the pilot study. Any students undergoing any psychological treatment or medication were excluded from the study. This differentiation was done to prevent contamination of the RCT study. The required sample needed was 12 participants according to a recommendation derived from the work of Julious (2005). Further details are found in Chapter 7.

**The Independent Variable: The Intervention**

**The Intervention Overview**

This section applies only to the interventional studies in this thesis, that is, the pilot study (Study 4, Chapter 7) and the RCT study (Study 5, Chapter 8). In the RCT study, the independent
variable was to attend a self-development coaching program called “How to Be an Ultra-Super Student” (HBUSS) by the participants in the intervention group (IG). The participants in the control group (CG) were required to attend a placebo program called “Learning and Success in Health Faculties” (LSHF). The participants in the pilot study had only an intervention group where the students were required to attend the HBUSS program.

HBUSS is a self-development coaching program that has been developed and run since 2008 by the author, who is also a self-development coach and trainer. It has been conducted commercially as a self-development coaching program where the coachees seeking this program or the bodies wishing to provide this program for their members, pay for it. On some occasions the program was conducted for free. The program was developed from the developer’s personal experiences, from reading and using self-development resources over a number of years. The program has been continuously developed by the author, through reading and applying feedback from attendees. Although the content was not derived from scientific, evidence-based resources, nevertheless, the next subheading discusses the program’s modules in the context of the scientific literature.

The program aims mainly to improve students’ academic performance and improve their psychological wellbeing whilst studying, through a series of skills practice, short exercises, and conceptual ideas. A participant has the freedom to choose from the program the ideas that suit him or her. The program is not based on any conventional psychological therapeutic approaches.

On the other hand, LSHF is a program developed during the preparation for this thesis only as a placebo program. It is not a commercial program. It aims to provide information about learning in health faculties and factors leading to success according to the data in scientific publications. It also gives a brief of scientific research in the public health field. Nevertheless, no practical skills or values in the program can be used by students to improve their academic performance.

It is important to emphasise that the control group’s program, LSHF, was formed to counter the placebo effect of attending a self-development coaching program. All the information that was provided in this program was derived from academic articles or academic books. Table 4.1 provides a full description of the main intervention in addition to comparisons between HBUSS and LSHF. Other details about the program implementation will be discussed later.
Table 4.1.

**Comparison between the HBUSS and LSHF programs**

<table>
<thead>
<tr>
<th></th>
<th>How to Be an Ultra-Super Student program (HBUSS)</th>
<th>Learning and Success in Health Faculties program (LSHF)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Attendees</strong></td>
<td>Participants in the interventional group (IG)</td>
<td>Participants in the control group (CG)</td>
</tr>
<tr>
<td><strong>Program components</strong></td>
<td>Each program is composed of a live course, program package, and program CD.</td>
<td></td>
</tr>
<tr>
<td><strong>The course materials</strong></td>
<td>The program package is given in a plastic folder that contains the program’s booklet, CD, pen, highlighter, post it note, participant’s badge and double headed colour pack. The booklet has all the lecture information and templates for the exercises.</td>
<td>The program package is given in a plastic folder that contains the program’s booklet, CD, pen, highlighter, post it note and participant’s badge. The booklet has all the lecture information and templates for the exercises.</td>
</tr>
</tbody>
</table>

It should be noted that the materials for both programs were alike in quality. Booklet covers are found in Appendix F. For a sample of the booklets or the CD, contact the author.

**The course modules**

<table>
<thead>
<tr>
<th>How to Be an Ultra-Super Student program (HBUSS)</th>
<th>Learning and Success in Health Faculties program (LSHF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The course includes six modules: 1. “Unleash Your Inner Power”, in which information about self-efficacy and goals in life are discussed in addition to some exercises to motivate students. 2. “Manage Your Time Effectively”, which gives different models and tips for how students might invest their time for achievement. 3. “The Maximum Usefulness of University Lectures”, in which different solutions are given to increase the benefits of lecture time and dealing with universities’ lecturers. 4. “How to Study and Memorise Effectively”: this part provides skills and techniques with simple exercises to increase academic achievement, such as positive thinking exercises. 5. “Dealing with Exams”, which provides ideas and tips</td>
<td>The course includes four modules. 1. Blooms’ Taxonomy about learning: developed by Bloom, Engelhart, Furst, Hill, &amp; Krathwohl (1956): this model describes the different types and levels of learning from cognitive, affective and psychomotor points of view. 2. A summary of a number of updated scientific articles about the relation between success in studying in health faculties and other factors such as the language, high school records, internal motivation, parents education, income, internal motivation, style of studying, self-efficacy and learning skills. These are only descriptive data and not “how-to” tips. 3. Active learning method and how it has been used in some health faculties. 4. The importance of scientific research in acquiring knowledge.</td>
</tr>
<tr>
<td>Program’s approach to conducting the course</td>
<td>Supplemental CD</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>• Motivational vocal tone and body language.</td>
<td>The CD contents were recorded using a conventional PC microphone and GoldWave v5.58, free version, software for audio editing. Each CD was provided in a CD box with a colour printed cover that has the program name and the coach name (Appendix G). Both programs’ CD covers have the same design but a different colour for each program (blue for intervention group program and green for control group program). Copying CDs was done manually on a standard computer device. It should be noted that both programs’ supplemental CDs were of the same quality. For a sample of the CDs, contact the author.</td>
</tr>
<tr>
<td>• Success and Islamic stories (parables).</td>
<td>CD contents</td>
</tr>
<tr>
<td>• Famous people and Islamic quotes.</td>
<td>The CD has two folders and a PDF file. The first folder contains 24 MP3 audio files (1 to 3 minutes) to motivate participants to study and to remind them about some of the contents of the main program. Participants were instructed to listen to a file each day. The second folder contains 2 audio files about muscle relaxation: short (6 minutes) and long (24 minutes). The PDF file contains instructions to participants that this CD is for personal use only.</td>
</tr>
<tr>
<td>• Re-contextualised ideals (metaphor).</td>
<td>The CD contains one folder and a PDF file. The folder has 24 audio files (1 to 3 minutes) resembling the content of the control group program. The PDF file also contains instructions to participants that this CD is for personal use only.</td>
</tr>
<tr>
<td>• Personification of some values.</td>
<td></td>
</tr>
<tr>
<td>• Movie clips.</td>
<td></td>
</tr>
<tr>
<td>• Direct interaction with the audience.</td>
<td></td>
</tr>
<tr>
<td>• Giving participants the freedom to choose amongst the programme techniques,</td>
<td></td>
</tr>
<tr>
<td>for dealing with different circumstances in exam periods.</td>
<td></td>
</tr>
</tbody>
</table>
that which suit them.

- Sharing some of the coach’s personal expertise.
- Clapping and cheering along with the course.
- Short exercises either individually or with peers.

| Duration | Two consecutive days, for 5 hours each day. Day 1: from 4–9 pm, and day 2: from 12–5 pm. The program was conducted during students’ free time. Each day students had multiple breaks 10–40 minutes. Students had time to do their religious prayer during the program. It should be noted that this program in the pilot study was conducted as a 12 hour program over two days. | One day for 4 hours. The program was conducted during students’ free time. The students had multiple breaks 10–40 minutes. Students had time to do their religious prayer during the program. |

**Literature review of the “How to Be an Ultra-Super Student” program content**

As there is a paucity of evidence-based research in this area, the content of the HBUSS program could not be based on empirically validated coaching strategies. Instead this section examines the construct validity of the content of HBUSS by linking the content to the relevant coaching literature.

Generally, there are many studies revealing the positive relationship between study skills and academic performance which have been evaluated through many systematic reviews and meta-analyses (e.g. Hattie, Biggs, & Purdie, 1996; S. B. Robbins et al., 2004). The first module in HBUSS to examine is, “Unleash Your Inner Power”, in which information about self-efficacy and goals in life are discussed in addition to some exercises to motivate students. S. B. Robbins et al., in their meta-analysis, found that self-efficacy, achievement motivation, and academic goals are associated with better student performance (2004). Grant (2003) found that goal setting also improved levels of depression, stress and quality of life for university students. Saudi medical students, in a qualitative study, illustrated that a positive attitude to study and confidence was an important determinant for effective learning (Alhaqwi, van der Molen, Schmidt, & Magzoub, 2010). This research illustrated that self-efficacy, goal-setting, self-motivation, and a positive
attitude to study have a positive correlation with students’ better psychological health and academic performance. Therefore, this supports the first module of HBUSS.

The second module is “Manage Your Time Effectively”, which gives suggestions and tips as to how students might invest their time for achievement. Research into time management emphasises its importance as a predictor of positive academic performance. A study carried out by a Texas medical school involving around 100 medical students found that time management skills were significant predictors of academic performance (Courtney West & Sadoski, 2011). The study found that planning and better management of students’ time and tasks improved students’ grades. This result was augmented by another study that found all students who achieved a high GPA had high scores in study skills, including time management (H.-I. Shin, Jeon, & Yang, 2010). Time management skills have been recommended in the literature for medical students as a major component of a program designed to improve their skills (Bhattarai, 2007; Haghani & Sadeghizadeh, 2011). So, there seems to be support in the literature for the second module as well.

Three systematic review articles on school students (Hattie et al., 1996; Masten & Coatsworth, 1998; Wang, Haertal, & Walberg, 1993) agreed with, and emphasised the importance of social skills that included interpersonal relationship skills for the students, which correspond to the third HBUSS module: “The Maximum Usefulness of University Lectures”, in which different solutions are given to increase the benefits of lecture time and dealing with universities’ lecturers. However, “skills during lecture time” were not evaluated or identified as a significant topic in the literature.

The fourth module is “How to Study and Memorise Effectively”. A study by Reid, Duvall, and Evans (2007) investigated the correlation in medical students between academic performance and learning approaches, which are surface (memorising without motivation), deep (understanding) and strategic (assessment motivated), and critiqued them. The authors found that the strategic and deep approaches had better correlation with answering multiple choice questions, but were ineffective sometimes in tackling short answer questions as they did not allow students to express their understanding (Reid et al., 2007). Furthermore, Hattie et al. (1995) stated that memorising skills are good if the perceivable aims are only to recall specific information accurately. However, they stated that the deep approach is important for better understanding.

So, it might be better to think about both memorising and understanding as collaborative skills for better performance. This was the conclusion reached after studying the learning approaches of medical students in Australia for the anatomy course in medical school (Pandey &
The authors explained that understanding was important to create the framework for knowledge, while memorising skills worked to manage information and to accurately recall it.

In fact, HBUSS contains only memorising skills exercises (surface approach) aiming to help students with the high volume of information contained in the medical syllabus, especially for the preclinical years. This might indicate that the HBUSS program helps for one approach, bearing in mind that the other approaches which are not included in the program (deep and strategic) might be more important for improving academic performance.

The fifth module of HBUSS to examine is “Dealing with Exams”, which provides ideas and tips to deal with different circumstances in exam time”. Dealing with exams has been a subject of interest in some medical educational studies. A study of medical students conducted to evaluate the effect of a program to tackle objective, structured, clinical exams (OSCE), found that the program did improve students’ GPAs significantly in comparison to their grades of the previous year and in relation to other students (Beckert, Wilkinson, & Sainsbury, 2003). This reflects the importance of exam skills in improving academic performance.

The sixth module is “Religious Teachings”, which provides several points from the Islamic view that augment the previous skills and values. For example, in this module, the coach discusses the importance of being confident that when one has made his or her best effort, God (Allah) will help him or her to achieve goals. This is a perspective valued by a Muslim population such as that of Saudi Arabia. In addition, this module encourages the students to pray regularly, on time. In this context, a study conducted in Iran found a correlation between religious prayer and the level of depression among medical students where the higher the compliance to prayer, the lower the depression level the students had (Ranaie et al., 2011). This illustrates the possibility that this module is also likely to be beneficial for students’ psychological health.

The last part to examine is the program’s CD content, which is about muscle relaxation exercises. Muscle relaxation is a method which has different approaches aim to relax the body using an intentional focus through imagining or through specific exercises (Jain et al., 2007). Muscle relaxation tries to release body tension, which leads to a state of calm (Benson, Greenwood, & Klemchuk, 1975) and this has been tested via empirical studies and shown to alleviate anxiety, distress, and depression for students and for other populations as well (Luebbert, Dahme, & Hasenbring, 2001; Morgan & Jorm, 2008; Stetter & Kupper, 2002). More precisely, a randomised, controlled trial study on a sample of medical students and other health professionals compared the effect of muscle relaxation and mindfulness meditation on psychological, rumination, and mood.
status. This study found that muscle relaxation changed the psychological status and the mood significantly, though not as efficiently as mindfulness. Conversely, muscle relaxation was not effective statistically in a study, when used with dental students to deal with stress and anxiety in their first paedodontic dental filling in a clinical trial (Piazza-Waggoner, Cohen, Kohli, & Taylor, 2003). Thus, muscle relaxation seems to be a promising method of dealing with negative psychology, but results might vary according to the population being studied.

Before discussing conclusions from the above research, it should be mentioned that the modules were examined in terms of theme only, and that the particular information, tips and exercises in each theme were not examined. For example, time management was indicated to be useful, but the tips relating to time management (such as using a calendar and task prioritisation), that are explained in the HBUSS module, were not examined precisely. Also, the above examination of the program did not evaluate the combination of these modules into a holistic program and so did not assess their effectiveness in combination. Thus it is hard to claim that the HBUSS program can produce academic or psychological improvement without interventional data.

In short, “How to Be an Ultra-Super Student” is an example of a self-development coaching program which aims to improve students’ academic performance and psychological health. Reviewing the program content and comparing it with the extant literature indicates that the program is, in general, supported scientifically as having a positive effect on psychological health or academic performance across many modules. However, the combination of these modules is not yet proven to be effective, neither in the fine details nor in the skills, as this has not yet been investigated thoroughly.

The Dependent Variables: The Outcomes and Research Instruments

There are three main outcome domains being measured, as displayed in the following:

1) Psychological health (two aspects):
   a) The negative aspect: represented by levels of depression, anxiety, and stress. These were measured with the Depression Anxiety Stress Scale (DASS21) (Lovibond & Lovibond, 1995).
b) The positive aspect: represented by levels of self-efficacy and life satisfaction. They were measured with the General Self-Efficacy scale (GSE) (Schwarzer & Jerusalem, 1995), and the Satisfaction With Life Scale (SWLS) (Diener et al., 1985).

2) The students’ academic performance: measured by students’ academic grades.

3) Three domains that have been suggested to affect the coaching program outcomes:
   a) Students’ perception of the intervention and the placebo programs; measured by the Credibility and Expectancy Questionnaire (CEQ) (Devilly & Borkovec, 2000).
   b) Coach and coaching program characteristics which were derived from the literature review; measured by self-reported questions with a scale of 1–10.
   c) Demographic data that includes: gender, faculty, academic year, marital status, family income, and nationality.

**Depression Anxiety Stress Scale – short form (DASS21)**

This self-reported scale, DASS21, is the short form of the original scale (DASS42) which was developed by Lovibond and Lovibond (1995) to evaluate the depression, anxiety and stress symptoms in one scale. DASS21 is composed of 21 questions investigating the previous week’s state with seven questions per subscale (depression, anxiety and stress).

Each question has a scale from 0 – “Did not apply to me at all” to 3 – “Applied to me very much, or most of the time”. Each construct score equals the sum of the subclass’s seven corresponding questions multiplied by a factor of 2 to produce an equivalent score of the original DASS42 scale. The manual for DASS21 scoring (Henry & Crawford, 2005; Lovibond & Lovibond, 1995) shows that:

1) Depression subscale score is considered as normal (0–9), mild (10–13), moderate (14–20), severe (21–27) and extremely severe (28–above).
2) Anxiety subscale score is considered as normal (0–7), mild (8–9), moderate (10–14), severe (15–19) and extremely severe (20–above).
3) Stress subscale score is considered as normal (0–14), mild (15–18), moderate (19–25), severe (26–33), and extremely severe (34–above).

DASS21 has good psychometric properties as was found in many articles (Antony, Bieling, Cox, Enns, & Swinson, 1998; Brown, Chorpita, Korotitsch, & Barlow, 1997; Henry & Crawford, 2005), and similar to the original DASS42 (Henry & Crawford, 2005). The internal consistency of DASS21 is excellent as it ranges from .88 to .95 for stress, .81 to .92 for anxiety, and .91 to .97 for
depression. Also, assessing the validity of DASS21 shows a good correlation with other scales used to assess psychological distress (Antony et al., 1998) such as the Beck Depression Inventory (BDI) (Beck, Ward, & Mendelson, 1961) and the Beck Anxiety Inventory BAI (Beck, Epstein, Brown, & Steer, 1988).

There are three advantages in using this scale in this thesis. First, DASS21 was found to differentiate between psychiatric patients and non-psychiatric patients (McDowell, 2006). Second, DASS21 has been used in other coaching interventional studies (Grant et al., 2009; S. Green, Oades, & Grant, 2005) and therefore results in this thesis are comparable with other studies’ results. Finally, DASS21 measures three psychological dysfunctions with a small number of questions, compared to other scales such as the Beck Depression Inventory (BDI) (21–item) and Beck Anxiety Inventory BAI (21–item).

DASS21 has been translated and validated into the Arabic language (Taouk, Lovibond, & Laube, 2001). It is in the public domain and no permission is required for it to be used.

**Satisfaction With Life Scale (SWLS)**

The SWLS is a 5–item self-reported instrument to measure one's satisfaction with life from a cognitive point of view (Diener et al., 1985). Each question has a scale of 7 points to answer ranging from 7 – “Strongly agree,” to 1 – “Strongly disagree”. The summed score can be represented as an SWLS score or can be categorised into six categories ranging from Very highly satisfied (30–35), Highly satisfied (25–29), Average (20–24), Slightly below average (15–19), Dissatisfied (10–14), and Extremely dissatisfied (0–9). SWLS has a Cronbach’s alpha scored from .86 to .87 (Adler & Fagley, 2005; Steger, Frazier, Oishi, & Kaler, 2006), and scored .80 to .84 in test-retest reliability (Pavot, Diener, Colvin, & Sandvik, 1991; Steger et al., 2006), which indicates it has excellent psychometric properties.

SWLS has been selected in this study, in addition to GSE, to widen the spectrum of the psychological domain to include positive psychology rather than limit it to the psychological distress assessments represented by DASS21. SWLS is a way to detect undesirable factors in one’s life (Pavot & Diener, 1993) rather than those listed in DASS21. In addition, SWLS is a long term, personal, conscious appraisal for the whole of life (Pavot & Diener, 1993) and not an assessment for an immediate or short period of time, such as DASS21. Finally, SWLS has been also used as a measurement tool in other coaching publications (L. S. Green, Oades, & Grant, 2006; S. Green et al., 2005).
There are two Arabic translations for SWLS: one done in 1998 (Abdallah, 1998), and the other version on Professor Diener's SWLS-website (Diener, 2009). However, as the principal investigator is an Arabic native speaker, he decided to include this scale in the translation process of the questionnaire because the available versions have some discrepancies. This scale is in the public domain and can be used without permission (Diener, 2009).

**General Self-Efficacy Scale (GSE)**

GSE is a self-reported 10–item scale that evaluates the personal beliefs to adapt to different demands to achieve personal goals (Schwarzer & Jerusalem, 1995). Each question has four answer options: 1= Not at all true, 2 = Hardly true, 3 = Moderately true, 4 = Exactly true. The total score for GSE can be used as a continuous value, as there is no categorical classification to this scale. GSE is found to have a high internal consistency, as Cronbach's alpha is .89 in a large sample from 25 countries including Arabian countries (Scholz, et al., 2002).

This scale was selected as an additional instrument to assess the positive aspect of psychological health, because the literature review illustrated the importance of self-efficacy as a psychological construct. There is also an Arabic language version of this scale (Scholz et al., 2002) and the scale can be used without permission as it is in the public domain (Schwarzer & Jerusalem, 1995).

**Credibility and Expectancy questionnaire (CEQ)**

The Credibility and Expectancy questionnaire (CEQ) is a 6–item self-reported scale used for measuring rational credibility and treatment expectancy for clinical studies from affective and cognitive points of view (Devilly & Borkovec, 2000). Credibility refers to “how believable, convincing and logical the treatment is”, while expectancy is defined as “improvement that client believed will be achieved” (Kazdin, 1979, p. 82). The first three questions in the scale measure credibility, while the last three measure expectancy. Each question has either a scale of (1–9) or (1–100%). Thus, standardisation was conducted when summing each subscale score during data analysis. The scale has a high internal consistency as the total scale Cronbach's alpha is .84 to .85 among three different populations (Devilly & Borkovec, 2000). This questionnaire has been used in a number of studies to see the effects of expectation and credibility on the outcomes (Donker et al., 2009; Titov et al., 2009).
This scale was included in the questionnaire to assess the influence of cogitative and affective perception before and after the intervention. The CEQ has no previous version in the Arabic language, so it has been translated into Arabic language as detailed in the translation process below.

**Coaching program and coach characteristics (CPCC)**

There were some coaching programs and coach characteristics that were highlighted as distinctive during the self-development coaching program as detailed in Study 1, Chapter 3. These characteristics were made into eleven self-reported questions. These questions are divided into two categories:

1) The coaching program characteristics, which include: enabling participants to have experience of the program contents, level of program relevance, and degree of satisfaction about the program.

2) The coach characteristics, which include: empathy, confidence, using his or her personal experience, persuasiveness, ability to maintain the audience’s attention, being able to influence participants' emotions, acting as a role model, and the coach’s level of motivation.

The students were asked to rate the program (both intervention and placebo) and the coach for each question from 1–10, after the intervention was conducted. The internal consistency and validity of this set of questions have not been tested elsewhere in the literature, as they were developed during the development of this thesis. This section was important to identify whether these characteristics differ between self-development coaching programs and normal lectures or not. This part was included in the translation process also.

**Academic Performance**

The academic performance of students was measured by their weighted grades percentage (WG) at the end of the first term (before the intervention) and at the end of the second term (after the intervention by 4 months). Students’ weighted grades were measured using the following equation:

\[
\text{Weighted grade percentage (WG)} = \sum \frac{(\text{each unit’s grades} \times \text{unit’s credit hours})}{(\text{total unit’s credit hours})} \times 100
\]
Using WG is a more accurate measure than a student’s grade point average (GPA), although this has been used in similar studies (Grant, 2001b). This is because GPA usually takes into account the previous year cumulatively, and the course units that students study have different credit hours. Term-GPA was another choice; however, some unit courses in the medical and dental faculty at UQU are taken over two terms of a full academic year, and grades for the first term are not displayed in the students’ transcript for the first term. Thus, WG equation was chosen for greater accuracy. Students’ grades for each course unit were retrieved from medical and dental faculties at the end of the year after obtaining participants’ permission.

**Questionnaire Translation**

Among the outcomes sections, four sections needed to be translated from English into Arabic, which are: demographic SWLS, CPCC, and CEQ. The demographic section was a straightforward section. For the other section, the WHO translation guideline (WHO, 2013) was used after it was modified according to the thesis scope. The translation process is detailed in Figure 4.1. The modified guideline was presented in a checklist as detailed in Table 4.2.
Figure 4.1. The translation process of the Satisfaction With Life Scale (SWLS), Coaching Program and Coach Characteristics (CPCC), and Credibility and Expectancy Questionnaire (CEQ)
Table 4.2.

*Modified WHO guidelines translation checklist*

<table>
<thead>
<tr>
<th>Process</th>
<th>✓</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Forward Translation</strong></td>
<td></td>
<td><strong>✓</strong> This part was done by the principal investigator who is an Arabic native speaker and studied his undergraduate and postgraduate in English for 9 years in the medical field.</td>
</tr>
<tr>
<td>A bilingual translator who works in the health profession and is familiar with questionnaire terminology.</td>
<td></td>
<td><strong>✓</strong> An instructional part in the CEQ, was deleted in the questionnaire due to redundancy and inadequacy. This part was “We do not want your therapist to ever see these ratings, so please keep the sheet covered when you are done”. CEQ was at the end of the questionnaire. Finding this instruction at the end of the questionnaire might give an indication that this section is more important than others and might disrupt the bond of confidence between research assistants and participants from a cultural point of view. In addition, in the CEQ section, the word “therapy” was replaced by “program”.</td>
</tr>
<tr>
<td>Conceptual translation (not literal).</td>
<td></td>
<td><strong>✓</strong> Using language acceptable and natural to the large spectrum of audience.</td>
</tr>
<tr>
<td>Using language acceptable and natural to the large spectrum of audience.</td>
<td></td>
<td><strong>✓</strong> No jargon (idioms or technique terms).</td>
</tr>
<tr>
<td>No jargon (idioms or technique terms).</td>
<td>✓</td>
<td><strong>✓</strong> Using clear, simple words.</td>
</tr>
<tr>
<td>Using clear, simple words.</td>
<td>✓</td>
<td><strong>✓</strong> Using language that is suitable for differing ages and genders.</td>
</tr>
<tr>
<td>Using language that is suitable for differing ages and genders.</td>
<td>✓</td>
<td><strong>✓</strong> No term that is considered offensive.</td>
</tr>
<tr>
<td><strong>Expert Panel</strong></td>
<td></td>
<td><strong>✓</strong> An additional step is having an accredited translator to conduct a blind translation to the questionnaire from English to Arabic, and compare that translation with the first version by the panel of experts (in the next section).</td>
</tr>
<tr>
<td>Forming a panel of experts who are bilingual health professionals, including the editor-in-chief</td>
<td>✓</td>
<td>Bilingual medical doctor and nurse who are PhD candidates in public health, in addition to the original translator who is the editor-in-chief.</td>
</tr>
<tr>
<td>They have to be experts in translation and instrument development.</td>
<td>✓</td>
<td>They are PhD candidates who work on public health projects.</td>
</tr>
<tr>
<td>Manage any inadequate concepts /expressions.</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Proving solutions for alternative translation.</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Ensure that the questionnaire is aligned with previous translations.</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Forming a translated version</td>
<td>✓ Many modifications had been done to the original author’s version.</td>
<td></td>
</tr>
</tbody>
</table>

## 2. Back Translation

| Independent translators have no previous experience with the questionnaire. | ✓ There were 2 different back-translators to achieve the best quality of work: A medical physicist and a different accredited translator. |
| Editor-in-chief addressing any conflict or inadequacy. | ✓ |
| Raise attention to any problematic terms or expressions. | ✓ Some words which are used interchangeably in Arabic were identified during the back translation and are: (ideal) in SWLS section = in the back translation (perfect) (empathy) in coach characteristics section = in the back translation (sympathy) (coach) in coach characteristics section = in the back translation (trainer) Also, in the CEQ section, (Open minded) has no perfect equivalent in Arabic because it has other implications and meanings from a cultural point of view. |

## 3. Pre-testing and cognitive interviewing

| This is done by testing the translation on participants who are not eligible for the main study but who represent the participants. | ✓ This is done by medical students at UQU in Saudi Arabia who served as research assistants later on in the main program. They were 16 male and female students from the medical and dental faculty. This step was also repeated during the pilot study (Study 4, Chapter 7). |
| They must be male and female, above 18 years old. | ✓ |
| Filling in the questionnaire then discussion on each section to resolve any discrepancies. | ✓ A group discussion was done on every section to detect any difficulty in understanding of any question. All questions were understandable; however, one of the groups asked about the difference between Q1 and Q12 in DASS. The Question 1 statement is, “I found it hard to wind down” while the Question 12 statement is, “I found it difficult to relax”. “Wind down” is an idiom that has no equivalent in Arabic. |
So the literal translation from Arabic for Q1 is “I found it hard to relax and rest”. So, those two questions were similar to each other. However, this Arabic version has been evaluated and tested in a previous publication (Taouk et al., 2001), so no change has been made.

Also, authors reported that there are better forms for structuring the question from an Arabic rhetorical point of view. These forms were over-estimated and not essential to understanding the questions but rather made it perfect rhetorically. Thus, these suggestions were not taken into consideration.

Find any offensive or unclear word that is not understood and give any alternative.

<table>
<thead>
<tr>
<th>4. Final Version:</th>
</tr>
</thead>
<tbody>
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<td>Serial number for each document:</td>
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<td>Translation v.2: Forward translation by the accredited translator.</td>
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<tr>
<td>Translation v.3: Forward translation combination of the principal investigator and the accredited translator.</td>
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<tr>
<td>Translation v.4: Version from expert panel with a summary of recommendations by panel experts</td>
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<td>Translation v.5: Back-translation Version into English: by a PhD student</td>
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<td>Translation v.6: Back-translation Version into English: by accredited translator</td>
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<tr>
<td>Translation v.7: Modification of the Arabic version</td>
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<td>Translation v.8: The final version after pre-testing and cognitive interviewing.</td>
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</table>
Data collection

This section illustrates data collection phases and steps. It also explains the questionnaire composition, participants’ recruitment, enrolment, data collection protocol, research assistant team and incentives. It also lists the main differences in data collection between the main and pilot studies phases.

The data from all the studies in this thesis were collected in two phases with seven stages in the academic year of 2012–2013, as detailed in Figure 4.2 below:

Figure 4.2. Data collection timeframe

- Phase I: the pilot study phase:
  - (P–T1) at week 11 of the first term, when the students who participated in the pilot study received the pre-intervention questionnaire (P–Q1)
  - (P–T2) at week 12 of the first term, when the students who participated in the pilot study received the post-intervention questionnaire (P–Q2).

- Phase II: the main studies phase:
  - (T1) at week 12 of the first term, when the students of the main studies were recruited and received the first questionnaire (Q1)
  - (T2) at week 1 of the second term, immediately before the intervention was conducted, and when the students of the main studies received the second questionnaire (Q2)
  - (T3) at week 2 of the second term, a week after intervention, when the students of the main studies received the third questionnaire (Q3)
  - (T4) at week 6 of the second term, five weeks after the intervention, when the students of the main studies received the fourth questionnaire (Q4)
(T5) at the end of the second term, after students’ grades were released. Students’ academic grades of the first term (before the intervention) and the second term (after the intervention) were retrieved from the medical and dental faculties at UQU.

Data from P–T1 and P–T2 were used to in the pilot study (Study 4, Chapter 7). Data from T1 and T5 were used in the cross-sectional study (Study 2, Chapter 5). Data from T1 and T2 were used in the longitudinal study (Study 3, Chapter 6). Data from T2, T3, T4, and T5 were used in the RCT (Study 5, Chapter 8). The data for the pilot study were to be gathered in weeks 10 and 11 in the first term of the 2012–2013 academic year. However, a pop-quiz was conducted at that time, so the pilot intervention and the questionnaire were shifted forward by one week.

It should be noted that the previous abbreviations might have a different meaning in each study. However, they will have the same meaning here and in the discussion chapter later on.

**The Questionnaire Composition**

The questionnaires were delivered as hard copies that take 7–10 minutes to answer. The hard copy questionnaire was preferred to the online method because of an anticipated low response to online surveys. A mail method cannot be used in Saudi Arabia because Saudi has no mature mail system yet.

The questionnaires at the different times detailed above did not include all the outcomes sections. Instead they were formulated as detailed in Table 4.3. The final versions of the questionnaires in English and Arabic are found in Appendices I and J.

<table>
<thead>
<tr>
<th>Time</th>
<th>Content</th>
<th>DASS21</th>
<th>GSE</th>
<th>SWLS</th>
<th>Demographic</th>
<th>CCC</th>
<th>CEQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-Q1</td>
<td>Pre-intervention of the pilot study</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>P-Q2</td>
<td>Post-intervention of the pilot study</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Q1</td>
<td>Recruiting time</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Q2</td>
<td>Immediately before the interventional program began, on</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
</tr>
</tbody>
</table>
There were blanks for the date, student’s name, mobile phone number and university ID on each questionnaire. This information was used to match students with their academic grades. All identifying information was destroyed upon data completion as the data were treated anonymously. Questionnaires of the main study phase (Q1, Q2, Q3, and Q4) were distributed using differently coloured paper for each, to make it easy to identify questionnaires during data entry (Q1 = white, Q2 = blue, Q3 = yellow, Q4 = green).

**Recruiting and Enrolment**

For the pilot study, recruiting was done by personal invitation from the research assistants to their colleagues in the fourth, fifth, and sixth years, at week 11 of the first term. The main study phase was advertised via large roll-up posters (Appendix K) to be visible in UQU medical and dental faculties. This was in addition to personal invitations to all students in the target population. The invitations were given at week 12 of the first term in an open envelope that included a coloured flyer (Appendix L), a map of the theatre location for the intervention (Appendix M), a study information sheet and consent form (Appendix C), in addition to the first questionnaire (Q1) in Arabic.

Confirming participation in the main study phase was done by reading and signing the consent form, answering the first questionnaire, and giving the consent form and Q1 in the provided envelope (sealed) to one of the research assistants.

**Data Collection Protocol**

P–Q1, Q1, Q3, and Q4 were distributed by the research assistants and class leaders between lectures. Participants filled out questionnaires manually and then gave them back to the research assistants. Absent students at questionnaire distribution times were advised to fill the questionnaire in the next day and give it to the assigned research assistant. On the other hand, P–Q1 and Q2 were

<table>
<thead>
<tr>
<th></th>
<th>the same day of the program</th>
<th>Q3</th>
<th>Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A week from the start of the program</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>After 5 weeks of the program</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>
distributed and gathered immediately before the pilot study and the main intervention, at the programs’ theatres.

**Research Assistants Team**

To collect the data and conduct the intervention, a research assistant team of 29 volunteers was formed including a professional event organiser, and members of the medical and dental faculties at UQU (18 males, 10 females). Their roles included assisting the principal investigator in recruiting, running the intervention, and collecting the data. The volunteers were awarded a certificate of appreciation and a personal formal letter.

The author trained all research assistants, which included explaining the project aims, process, tasks, time frame, and the consent information of the main and the pilot study. The author explained differences between the main study which involved two programs and two groups, and the pilot study which had one program and one group. Not to reveal a placebo control program, the volunteers were informed that this project was to assess the effectiveness and the effect of both programs. This was essential to ensure that the blindness step not be breached by the research assistants or the participants.

**Recruiting Incentives**

There were a number of incentives for participants. The main incentive was that the programs were free of charge. Such self-development programs are usually worth 200–300 Saudi Arabia Riyal (SAR), which equals AU$52 to AU$78. Also, the participants received a certificate of attendance and random number draws for gifts worth 50 SAR, (AU$13) as a voucher from a well-known local bookstore.

**Interventions Setting**

All the interventional programs that were conducted during the pilot and the main study were held in theatres in *Umm al-Qura Charity Society Women*, Makkah and *King Abdullah Medical City*, Makkah. The theatres had audio-visual facilities. Catering services were provided and praying rooms were allocated.
For cultural reasons in Saudi Arabia and especially the holy city of Makkah, the male students were segregated from the female students. In the pilot study theatre, a barrier was provided by *Umm al-Qura Charity Society Women* to be used. The theatre of *King Abdullah Medical City* (for the main study) was not equipped with such a barrier. However, as the theatre was large, a custom-made fabric barrier was installed for gender segregation. This barrier was made using five customised concrete bases with plastic pipes to hold a 20 meter length of fabric which equalled the length of the theatre (see Figure 4.3). This barrier was installed in the theatre before the day the programs were conducted.

![A diagram of the customised barrier](image1)

![The picture shows the female section only, with the customised barrier installed to the left of the picture, separating the other side of the theatre](image2)

*Figure 4.3. The theatre of the main study and the customised barrier*

**Randomisation**

Randomisation was only a part of the main interventional study (Study 5, Chapter 8). All participants signed the consent form, answered the first questionnaire and returned it and were stratified according to faculty, academic year and gender, as shown in Figure 4.4.

![Stratifying the participants in the main interventional study](image3)

*Figure 4.4. Stratifying the participants in the main interventional study*
Students were cluster-randomised into the IG and CG. Random number lists were generated using a computer-generated random number command in Excel software. A different random number list was attached to every stratum. It was pre-determined that every participant with an even number (in the random number list) would go to CG, and every participant with an odd number would go to IG to ensure concealment of allocation. Students knew their assigned group one week before the conducting of both programs. Participants were free to drop out of the study.

**Setting Adjustment after Conducting the Pilot Study**

The aim of the pilot study was to test the conductibility of the main interventional study and to add further validation to the questionnaire translation. In addition, it aimed to provide initial data of the effect of the HBUSS program on the students’ psychological health. So a number of setting modifications were taken after the pilot study, and included:

1. The HBUSS duration was shortened from 12 hours to 10 hours over two days. This was done after organising the intervention task timetable.
2. Some interruptions occurred due to interruptions by research assistants, so non-verbal communication signs were created, such as: raising a black card meant “Time for catering”; a red card meant, “There is an emergency and the program needs to stop right now”; and yellow meant “You have five minutes to have a break”. All of these modifications were made to control interruptions to the intervention.
3. Some participants in the pilot study attended the interventional program late. This is a cultural habit, especially for free educational programs. Thus, the participants in the main study were asked to attend 30 minutes earlier to register as a condition of attending the program.
4. During the pilot study, a non-invited participant attended the program. Thus, for the main study, all participants needed to wear a badge, received upon registration, during the whole program, after the initial checking of the participant’s name on the list of participants’ names.
5. Collecting the P–Q2 was very difficult and participants returned P–Q2 late. In the main study, there were two certificates as explained earlier. This aimed to motivate the participants to complete all the questionnaires. Also, medical and dental class leaders were invited to be research assistants to help data collection from students, as they were in close contact with the students.
Data Analysis

SPSS version 21 software (IBM Corp., Armonk, NY, USA) was used as the data analysis tool. All the data analysis processing and tests used are detailed for each study in the following chapters.

Resources and Funding

To collect the data, and to conduct the pilot and main interventions, some expenses were involved, including: questionnaire copies for multiple follow-ups for all the participants; advertising the main study; letter of invitation; program theatre preparation; certificates of attendance; the incentives; and catering for the students. In addition to these expenses, the program packages had other costs, such as those for the folder pack, CD, CD cover, booklet, badge, colour pen, highlighter, pen, post-it note, and a microphone to record the CD. For this thesis, the author used the student allocation fund for the PhD degree, which was offered by Queensland University of Technology, and the research funding from the Umm Al-Qura University scholarship. The total cost of this project, including the costs of the questionnaire copies, flyers, invitation letter, program theatre preparation, the intervention package, catering, certificates and incentives, was 17,895 SAR. This was equal to AU$4,636, where the Australian Dollar was equal to 3.86 Saudi Riyal at time of the data collection.

Research Ethics and Registration

There were five ethical considerations which were administered during the conducting of this thesis. First, each student signed the study consent form (Appendix C) to use his or her data and his or her academic records anonymously. Second, letters of permission were obtained from medical and dental faculties at UQU (Appendices N and O). Third, approval letters from Umm Al-Qura Charity Society Women and King Abdullah Medical City to use their theatres were obtained, as shown in Appendices P and Q.

According to Chapter 2.1 of the National Statement on Ethical Conduct in Human Research (2007), this project is a low risk research project because the foreseeable risks do not exceed discomfort. This study included attending the course, listening to the motivational CD and filling in
the questions. The activities were expected to cause little anxiety, feelings of boredom or time consumption of the participants. However, it was not considered high risk research according to the guidelines defined by the University Human Research Ethics Committee (UHREC). So, the application for this project was approved by the Chair, UHREC and confirmed as meeting the requirements of the National Statement on Ethical Conduct in Human Research (2007) by the number 1200000411 (Appendix R).

Finally, the RCT study (Study 5) was registered at the Australian New Zealand Clinical Trials Registry (ANZCTR) with the number ACTRN12614000896673, (Appendix S)
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Chapter 5. Psychological well-being status among medical and dental students in Makkah, Saudi Arabia: A cross-sectional study (Study 2)

Title: Psychological Well-being Status Among Medical and Dental Students in Makkah, Saudi Arabia: A Cross-sectional Study


Medical Teacher is a peer reviewed journal; 5-years Impact Factor: 2.17.

Date of submission: 30/6/2014

Date of acceptance after revision: 4/2/2015

Contribution of authors: The candidate is the primary author of this study, and was responsible for reviewing the literature, designing the study and directing its implementation, data collecting, data analysis, data interpretation, critical discussion of the findings, and writing the manuscript. The second and third authors were the candidate’s supervisory team and they provided feedback and valuable input on the initial draft of the manuscript.

Implications to the thesis:

This study aimed to evaluate the prevalence of positive and negative aspects of psychological health among the target population of this thesis. This study gave an answer to the first question of this thesis by finding that the depression, anxiety, and stress levels among preclinical students in Umm Al-Qura University UQU, Makkah, Saudi Arabia, were almost double the norm of other populations such as the Australian population. On the other hand, self-efficacy and life satisfaction levels were similar to those of similar studies. This might indicate that the positive and negative aspects of psychology act differently.
The study also partially answered the third research question in this thesis by giving an indication of the highest at-risk subgroups. It found that depression, anxiety, stress, self-efficacy, and satisfaction with life were different among the different subgroups investigated. Gender, faculty, academic year, and family income were effect modifiers to the above constructs in different ways, as shown in the results. These findings provide an important background to the psychological status of the target population, which will aid in understanding the effect of the intervention conducted in Studies 4 and 5.

**Funding:** None.

**Ethical approval:** Queensland University of Technology (QUT), University Human Research Ethics Committee (UHREC) number 1200000411.

**Conflict of interest:** None.

**Note:** This paper, as presented in the following pages, has a slightly different format from the published paper.
Statement of Contribution of Co-Authors for Thesis by Published Paper

The following is the format for the required declaration provided at the start of any thesis chapter which includes a co-authored publication.

The authors listed below have certified that:

1. they meet the criteria for authorship in that they have participated in the conception, execution, or interpretation, of at least that part of the publication in their field of expertise;
2. they take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;
3. there are no other authors of the publication according to these criteria;
4. potential conflicts of interest have been disclosed to (a) granting bodies, (b) the editor or publisher of journals or other publications, and (c) the head of the responsible academic unit, and
5. they agree to the use of the publication in the student’s thesis and its publication on the QUT ePrints database consistent with any limitations set by publisher requirements.

In the case of this chapter:

**Publication title and date of publication or status:** Psychological well-being status among medical and dental students in Saudi Arabia: A cross-sectional study (published in 2015)

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<td>Xiang-Yu Hou</td>
<td>The second author and was one of the candidate’s supervisory team. She provided feedback and valuable input on the initial draft of the manuscript.</td>
</tr>
<tr>
<td>Esben Stroil</td>
<td>The third author and was one of the candidate’s supervisory team. He provided feedback and valuable input on the initial draft of the manuscript.</td>
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Principal Supervisor Confirmation

I have sighted email or other correspondence from all Co-authors confirming their certifying authorship.

Xiang-Yu Hou

Name: ____________________________ Signature: ____________________________ Date: 6/4/2015
Psychological well-being status among medical and dental students in Makkah, Saudi Arabia: A cross-sectional study

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Queensland University of Technology, Australia & Umm Al-Qura University, Saudi Arabia

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Abstract

Objectives: Medical and dental students experience poor psychological well-being relative to their peers. This study aimed to assess the psychological well-being among medical and dental students in Saudi Arabia, identify the high-risk groups and assess the association between the psychological well-being and the academic performance.

Methods: In this cross-sectional study, 422 preclinical medical and dental students at Umm Al-Qura University, Saudi Arabia, were recruited to assess their depression, anxiety, stress, self-efficacy and satisfaction with life levels using 21-items Depression Anxiety Stress Scale, General Self-Efficacy scale and Satisfaction With Life Scale. Students’ academic weighted grades were obtained later. Descriptive statistics and univariate general linear model were used to analyse data.

Results: High levels of depression (69.9%), anxiety (66.4%) and stress (70.9%) were indicated, whereas self-efficacy (mean=27.22, sd= 4.85) and life satisfaction (mean=23.60, sd= 6.37) were within the normal range. Female medical students had higher psychological distress in contrast to dental students. In general, third-year students were more depressed and stressed in comparison with second-year students, except for stress among dental students. Moreover, all females had higher self-efficacy than males. Life satisfaction was higher within the second-year and high family income students. Depression was the only psychological variable correlated with the academic performance.
Conclusion: High levels of psychological distress were found. Female medical students had higher psychological distress than males, whereas male dental students had higher distress than female. Medical students at third year were more depressed and stressed. Dental students were more depressed in the third year, but more stressed in the second year. Attention should be directed towards reducing the alarming levels of depression, anxiety and stress among medical and dental students.

Practical points

- Preclinical medical and dental students at UQU had high levels of depression, anxiety and stress, and normal levels of self-efficacy and satisfaction with life.
- The levels of psychological distress were higher than in normal populations.
- In general, females had higher distress than males among medical students, whereas male dental students had higher distress than females.
- There was a significant relation between depression and students’ academic performance.

Introduction

Increased attention has been directed to the high levels of psychological well-being among medical and dental students. Students’ psychological distress has been found to be associated with low academic performance, threatening the learning process (Abdallah et al., 2014; Mane Abhay et al., 2011; Roh et al., 2010), and found to be a predictor of psychological stigma within the professional life (Tyssen et al., 2002). This should be taken seriously, especially when it might potentially jeopardise patient care and safety (Dahlin et al., 2007).

Medical and dental students’ distress are well-documented globally (Alzahem et al., 2011; Dyrbye et al., 2006), with levels higher than that of their peers and corresponding populations (Dyrbye, et al., 2006; Mane Abhay, et al., 2011). Several factors have been suggested for this distress, including the large volume of information that needs to be retained, students’ academic competition, grade average point (GPA) and fear of failure (Alzahem, et al., 2011; Dyrbye, et al., 2006; Roh, et al., 2010). These factors might be accentuated in the preclinical years where the coursework units are more theoretical. This is supported by the literature, with evidence that medical students in their early years were more distressed than students in senior years (Al-faris et al., 2012; Dahlin et al., 2005), in contrast to other literature (Alzahem, et al., 2011; Jadoon et al.,
2010). Most medical and dental studies have found that females are more distressed than males (Abdulghani et al., 2011; Alzahem, et al., 2011; Dyrbye, et al., 2006), with the exception of a few studies that have found no gender differences (Moffat et al., 2004; Niemi et al., 2006). Furthermore, dental students have found to be more distressed in the United States (Birks et al., 2009; Murphy et al., 2009; Schmitter et al., 2008) and less satisfied in Germany (Jurkat et al., 2011) than medical students, but this needs further investigation.

The seminal work of Ryff (1989) illustrated that both negative and positive aspects should be included when investigating the psychological well-being. However, few studies into medical and dental student wellbeing have investigated the positive aspects of psychological well-being, such as life satisfaction and self-efficacy. Two study have indicated an association between the positive and negative aspects (Samaranayake et al., 2011; Swami et al., 2007). In fact, such investigations in Saudi Arabia are few and further studies are recommended (Inam, 2007), especially during the current reforming period in Saudi medical education (Telmanesi et al., 2011).

This study therefore aims to assess the prevalence of psychological well-being (both positive and negative aspects) and its relation to academic performance among preclinical medical and dental students in Makkah, Saudi Arabia. It also aims to identify groups at high risk for psychological distress.

Methods

This cross-sectional study investigated medical and dental students who were in their preclinical years at Umm Al-Qura University (UQU), one of the largest universities in Saudi Arabia. The bachelor of medicine/dentistry in Saudi Arabia is six-year programme in which year 1 is orientation, years 2-3 are preclinical, and years 4-6 are clinical. Using sample size formula of continuous outcome in a population (Sullivan, 2011, p. 171), the following inputs were used: 1) type I error of 5%, 2) a margin of error of 2 units as the most conservative (smallest) difference between anxiety categories in DASS-21, and c) standard deviation of 10.6 as the most conservative (largest) value from a similar study (M. Yusoff et al., 2013). Thus, a minimum sample of 108 participants was needed in order to detect an effect.

Purposeful selective sampling method was used to include only medical and dental students at preclinical years at UQU. Thus, all medical and dental students in their second and the third years at UQU (654 students) were invited to participate in this study during the 2012-2013 academic year. Students under psychological treatment or medications were excluded. The students were
approached during lectures in week 12 of the first term which was deemed the most suitable time away from student examinations. Each student received a questionnaire, a consent form to retrieve their academic data and an information sheet explaining confidentiality of the students’ information. The answered questionnaires and signed consent forms were returned within one week and included their university ID and a mobile number so we could follow up on any missing data and match data with students’ academic records. After data collection was finished, the data were processed anonymously.

The prevalence of the psychological well-being was measured by self-administered hard-copy questionnaires previously mentioned that included the Depression Anxiety and Stress Scale (DASS-21) (Lovibond et al., 1995), General Self-Efficacy scale (GSE) (Schwarzer et al., 1995) and Satisfaction With Life Scale (SWLS) (Diener et al., 1985). The 10-minute questionnaire also included demographic questions about academic year, faculty, gender, marital status, nationality and family income. Finally, students’ academic grades from the first term were obtained from faculties’ administration offices.

DASS-21 was used to assess depression, anxiety and stress, and represents the negative aspect of psychological well-being. It is composed of 21 questions with a 4-point (0-3) answer scale. Each subclass’s score equals the sum of 7 corresponding questions. The sum scores were multiplied by 2 to match the original scale score in DASS-42. Each subscale score ranged from 0 to 42. On the other hand, the positive aspect of psychological well-being was represented by self-efficacy using GSE and life satisfaction using SWLS. GSE is 10 questions with a 4-point (1-4) scale, providing sum score ranges from 4 to 40. SWLS is 5 questions with a 7-point (1-7) scale resulting in sum score ranges from 5 to 35. DASS subclasses, GSE and SWLS were represented in a continuous format, whereas DASS subclasses and SWLS were additionally displayed in a categorical format. The DASS21 and GSE scales was administered using the validated Arabic version of (Scholz et al., 2002; Taouk et al., 2001).The SWLS Arabic version was adopted from a translated version used in a recent pilot article for a similar purpose (Aboalshamat et al., 2013) using WHO guidelines (WHO, 2013). The Arabic version of SWLS was face and content validated in the previous study. All of these scales had good psychometric properties and are commonly used in such research.

Academic achievement was measured by the units’ weighted grades via the following formula:
Weighted grades percentage (WG) = \[ \sum \left( \frac{\text{each unit’s grades} \times \text{unit’s credit hours}}{\text{total units’ credit hours}} \right) \times 100 \]

Ethical approval for this project was obtained from Queensland University of Technology (QUT) (number 1200000411) in addition to formal written approvals from UQU’s faculties.

Data were analysed by SPSS v.21 software (IBM Corp., Armonk, NY, USA). The participants’ demographic and psychological well-being means, frequencies and percentages were displayed in tables. A univariate general linear model (GLM) was used to identify high-risk groups and predict students’ WG. The backward elimination method was used to select the variables within the GLM and all the demographic variables and interactions were included in the initial model of each psychological construct. Only the significant variables remained and are reported to form the final model. A p-value of less than 0.05 was the level of significance in all statistics.

**Results**

A total of 422 students returned the questionnaire with signed consent, as shown in Table 1. The overall response rate was 64.52%.

Table 1. Demographic data of the medical and dental student participants in the preclinical years at UQU

<table>
<thead>
<tr>
<th>Variable</th>
<th>No. (%) of participants (n = 422)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty</td>
<td></td>
</tr>
<tr>
<td>Medicine</td>
<td>350 (82.9%)</td>
</tr>
<tr>
<td>Dentistry</td>
<td>72 (17.1%)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>197 (46.7%)</td>
</tr>
<tr>
<td>Female</td>
<td>225 (53.3%)</td>
</tr>
<tr>
<td>Academic year</td>
<td></td>
</tr>
<tr>
<td>Second year</td>
<td>198 (46.9%)</td>
</tr>
<tr>
<td>Third year</td>
<td>224 (53.1%)</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>410 (97.2%)</td>
</tr>
<tr>
<td>Married</td>
<td>12 (2.8%)</td>
</tr>
<tr>
<td>Family income</td>
<td></td>
</tr>
<tr>
<td>&lt;10000 RS</td>
<td>137 (32.5%)</td>
</tr>
<tr>
<td>&gt;10000 RS</td>
<td>285 (67.5%)</td>
</tr>
<tr>
<td>Nationality</td>
<td></td>
</tr>
<tr>
<td>Saudi</td>
<td>411 (97.4%)</td>
</tr>
<tr>
<td>Non-Saudi</td>
<td>11 (2.6%)</td>
</tr>
</tbody>
</table>

RS: Saudi Riyal; UQU: Umm Al-Qura University.

The depression, anxiety, stress, SWLS, GSE means and standard deviations (SD) were 15.05 (SD = 9.12), 11.98 (SD = 8.82), 20.62 (SD = 9.04), 23.60 (SD = 6.37) and 27.22 (SD = 4.85),

respectively. Table 2 shows each category’s frequencies and percentages of depression, anxiety, stress and SWLS. An overall high prevalence of depression (69.9%), anxiety (66.4%) and stress (70.9%) was revealed. Even more alarming was the prevalence of students with severe symptoms (sever plus extremely sever category) within the DASS subclasses, which were 25.4%, 21.8% and 34.1%, respectively. In contrast, SWLS results displayed that only 24.9% were considered slightly below average or dissatisfied.

Table 2. Frequencies and percentages of depression, anxiety, stress, and SWLS levels among preclinical medical and dental students at UQU

<table>
<thead>
<tr>
<th>DASS (n = 422)</th>
<th>Negative psychological well-being</th>
<th>Positive psychological well-being</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Depression</td>
<td>Anxiety</td>
</tr>
<tr>
<td></td>
<td>frequency (%)</td>
<td>Cum%</td>
</tr>
<tr>
<td>Normal</td>
<td>127 (30.1)</td>
<td>142 (33.6)</td>
</tr>
<tr>
<td>Mild</td>
<td>74 (17.5)</td>
<td>86 (20.4)</td>
</tr>
<tr>
<td>Moderate severe</td>
<td>114 (27)</td>
<td>69.9</td>
</tr>
<tr>
<td>Extreme severe</td>
<td>56 (13.3)</td>
<td>43 (10.2)</td>
</tr>
<tr>
<td></td>
<td>51 (12.1)</td>
<td>91 (21.6)</td>
</tr>
<tr>
<td>Highly satisfied</td>
<td>80 (19)</td>
<td>75.1</td>
</tr>
<tr>
<td>High score</td>
<td>128 (30.3)</td>
<td>75.1</td>
</tr>
<tr>
<td>Average</td>
<td>109 (25.8)</td>
<td></td>
</tr>
<tr>
<td>Slightly below average</td>
<td>61 (14.5)</td>
<td></td>
</tr>
<tr>
<td>Slightly below average</td>
<td>36 (8.5)</td>
<td>24.9</td>
</tr>
<tr>
<td>Extremely dissatisfied</td>
<td>8 (1.9)</td>
<td></td>
</tr>
</tbody>
</table>

Cum%: cumulative percentage; DASS: Depression Anxiety and Stress Scale; GSE: General Self-Efficacy; SWLS: Satisfaction With Life Scale; UQU: Umm Al-Qura University.

GLM results (Table 3) revealed that depression was explained by academic year and the interaction between faculty and gender. Anxiety was explained only by the interaction between faculty and gender. Stress was explained by a model containing the interaction between faculty and gender and the interaction between faculty and the academic year. On the other hand, GSE was explained by gender only, whereas SWLS was explained by a model containing the academic year, marital status and family income.
Table 3. The final models of univariate general linear analysis of the psychological constructs and student’s weighted grades

<table>
<thead>
<tr>
<th></th>
<th>Adj-R²</th>
<th>Model</th>
<th>B</th>
<th>Partial Eta²</th>
<th>Sig.</th>
<th>Estimated mean</th>
</tr>
</thead>
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<tr>
<td><strong>Depression</strong></td>
<td>.029</td>
<td>Intercept</td>
<td>12.662</td>
<td>.129</td>
<td>.000</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Year</td>
<td>-1.845</td>
<td>.003</td>
<td>.036</td>
<td>13.787</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gender*Faculty</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male*Medicine</td>
<td>2.028</td>
<td>.016</td>
<td>.239</td>
<td>13.767</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male*Dentistry</td>
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<td>-</td>
<td>.011</td>
<td>17.207</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>4.388</td>
<td>.010</td>
<td>.010</td>
<td>16.127</td>
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<tr>
<td></td>
<td></td>
<td>Female*Dentistry</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>11.739</td>
</tr>
<tr>
<td><strong>Anxiety</strong></td>
<td>.029</td>
<td>Intercept</td>
<td>10.061</td>
<td>.096</td>
<td>.000</td>
<td>-</td>
</tr>
<tr>
<td></td>
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<td>Gender*Faculty</td>
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<tr>
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<td>1.55</td>
<td>.000</td>
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<td><strong>Stress</strong></td>
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<td>Intercept</td>
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<td>.158</td>
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<tr>
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<td></td>
<td>Second*Medicine</td>
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<td>.039</td>
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<tr>
<td><strong>GSE</strong></td>
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<td>Intercept</td>
<td>26.769</td>
<td>.943</td>
<td>.000</td>
<td>-</td>
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<td><strong>SWLS</strong></td>
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<td>.336</td>
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<td>-</td>
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<td></td>
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<td>Second year</td>
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<td></td>
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<td>Low</td>
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<td><strong>WG</strong></td>
<td>.111</td>
<td>Intercept</td>
<td>90.549</td>
<td>.895</td>
<td>.000</td>
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<td></td>
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<td></td>
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<tr>
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<td>.000</td>
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<td></td>
<td></td>
<td>Depression</td>
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<td>.018</td>
<td>.006</td>
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<td>Gender*Faculty</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male*Medicine</td>
<td>9.986</td>
<td>.049</td>
<td>.000</td>
<td>79.148</td>
</tr>
<tr>
<td></td>
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<td>Male*Dentistry</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>80.920</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female*Medicine</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>76.933</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female*Dentistry</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>88.692</td>
</tr>
</tbody>
</table>

Adj-R²: adjusted R²; GSE: General Self-Efficacy; SWLS: Satisfaction With Life Scale; WG: weighted grades.

a This parameter is set to zero because it is redundant.
b Covariates appearing in the model are evaluated at depression = 7.528.
c High family income: > 10,000 Saudi Riyals.
d Low family income: < 10,000 Saudi Riyals.
Overall students’ WG mean was 80.49 (SD 8.65). GLM results, in Table 3 show WG as a model of depression, gender, faculty and the interaction between gender and faculty. Depression was the only psychological construct that correlated with WG. Depression, male and medical faculty correlated with WG in a reverse manner.

**Discussion**

This study describes the psychological well-being and academic performance of 422 medical and dental students at Makkah, Saudi Arabia. In addition the study identified groups at risk for poor psychological well-being and risk factors for lower academic performance. The results of this study indicate that dental and medical students in Saudi Arabia do experiences high levels of psychological distress. Moreover, female medical students appear to have higher psychological distress than males, whereas male dental students have higher distress than female. Medical students at third year seem to be more depressed and stressed than second year students, while Dental students were more depressed in the third year, but more stressed in the second year.

Direct comparison of the levels of depression, anxiety and stress in our sample with non-university Saudi populations is difficult due to a lack of published studies in the area, however our sample did have significantly higher levels of distress compared with Western general populations of the same age. For example, the levels of depression, anxiety and stress in our population were almost double the levels found in an Australian population of 18 to 24 year olds (Crawford et al., 2011). Our findings therefore corresponds with other studies in international and Saudi literature that found medical students had higher levels of psychological distress than their peers (Al-Dabal et al., 2010; Dahlin, et al., 2005; Dyrbye, et al., 2006). Furthermore, our results indicate that depression, anxiety and stress was affecting two-thirds of the students and one-third of these students was within the severe categories. This agrees with the internationally high prevalence of psychological distress among medical and dental students (Alzahem, et al., 2011; Dyrbye, et al., 2006; M. S. B. Yusoff et al., 2011). However, our prevalence seemed higher than another Saudi study on female medical students that found depression, anxiety and stress levels, using DASS, to be 19%, 29.6%, and 31.6%, respectively (Balaha et al., 2010). The difference was probably from the exclusion criteria in Balaha’s study that excluded students with medical conditions. Comparing our results with studies of Saudi medical students using different instruments revealed that the depression percentage in our study was higher than others (Ibrahim et al., 2013; Inam, 2007), whereas anxiety and stress levels were similar to others (Abdulghani, et al., 2011; Ibrahim, et al., 2013). Interestingly, although some studies investigated psychological distress among Saudi dental
students (Al-Saleh et al., 2010; Al-Samadani et al., 2013; Al-Sowygh, 2013), our study might be the first according to our knowledge to indicate prevalence using an international instrument.

In contrast to the measures of negative affect, students’ SWLS mean was similar to other populations that ranged between 23.6 to 26.9 (Abdel-Khalek, 2013; Pavot et al., 2008). More specifically, our SWLS results aligned with other studies on medical students in New Zealand and India that ranged between 22.45 to 24.9 (Boparai et al., 2013; Samaranayake & Fernando, 2011). Also, GSE mean was slightly lower compared with a multinational study that had mean of 29.55 (SD =5.32) (Schwarzer R., 2011). However, our GSE mean was similar to that of a study of undergraduate students in the United Arab Emirates (27.88). In other words, the positive aspects of the psychological of medical and dental students almost matched the norm of the general population and the medical students.

Similar to other studies (Samaranayake & Fernando, 2011), the participants in this study seemed to be able to maintain relatively good satisfaction with life and good general self-efficacy, in spite of high levels of distress. This might indicate that the positive and negative aspects of psychology act differently; that is, a high level of satisfaction might result from students’ perception of high prestige, salary and a secure job in these fields (Al-Bitar et al., 2008), but it did not reduce psychological distress brought on by students’ other challenges.

We also found specific groups that were at higher risk for distress as that psychological status varied among faculty, gender, academic year and family income. DASS subclasses followed a unique pattern in which female medical students had more depression, anxiety and stress means than medical male students did, whereas male dental students had higher means than female dental students. It could be argued that this is due higher female ratio (53.3%), however, higher medical female distress was aligned with the similar literature (Abdulghani, et al., 2011; Al-Saleh, et al., 2010; Dahlin, et al., 2005; Dyrbye, et al., 2006; Inam, 2007). On the other hand, the higher distress within male dental students can be considered novel, because it contradicts most literature (Al-Saleh, et al., 2010; Al-Sowygh, 2013; Alzahem, et al., 2011; Mathias et al., 2005; Polychronopoulou et al., 2005). The reason for this is not clear and needs further investigation.

The different academic years associated with depression and stress levels were as follows:
1) students in the third year were more depressed than second-year students in the in both faculties.
2) Third-year medical students were more stressed than second-year medical students, whereas second-year dental students were more stressed. This aligned with the contradicting results of other literature where some studies indicate that the third year (Al-Saleh, et al., 2010; Saipanish, 2003;
Chapter 5. The Cross Sectional Study (Study 2)

Schwenk et al., 2010) and some studies indicating to the years preceding the third year (Aktekin et al., 2001; Dahlin, et al., 2005; Jadoon, et al., 2010) are the most distressful, while other studies found no significant difference between different years (Galán et al., 2014; Sugiura et al., 2005). This might result from the differences in curricula, teaching and assessment methods between faculties within the different years.

In terms of positive psychological aspects, females had lower GSE scores for both medical and dental faculties. This aligned with a study involving U.S. medical students (Goodin et al., 2014). Our results add to the literature by showing that dental students have the same GSE difference. Other demographic variables were insignificant in regards to GSE. On the other hand, SWLS level was different according to academic year, family income and marital status. Students in their second year were more satisfied than third-year students were. This can be explained by third-year students in both medical and dental faculties in UQU take the largest academic workload, which leaves no time for a personal life. Also, low SWLS was associated with low family income; this is supported by a Canadian study on medical students (Chow, 2005). Our results add to the literature that dental students respond the same way. Last, our results support that married participants were more satisfied than single participants. Nevertheless, this is a questionable result because of the small percentage of married participants (2.8%). Also, interesting is the finding that unlike studies in the United States, Canada and Malaysia (Dyrbye, et al., 2006; M. S. B. Yusoff, et al., 2011), family income was not significantly associated with psychological distress in our results. This might be because Saudi students are not required to pay tuition; instead, they receive monthly allowance.

Academic performance was measured using a WG formula that included the students’ grades within the first term only. GPA was not used because it is a cumulative assessment of the performance over all years and not specifically to the study time. WG was associated with faculty, gender and depression. Dental students had higher WG than medical students, which might be explained by the differences in the course units, assessment methods, faculty administrative medium, teaching staff and year of school. In regards to gender, females had better academic performance than males in general according to a systemic review finding (Ferguson et al., 2002) and, specifically, to a Jordanian study on dental students (Sawair et al., 2009). More importantly, depression was the only psychological predictor of academic performance which is similar to studies with Egyptian health students (Hamaideh et al., 2014) and South Korean medical students (Roh, et al., 2010). Also, our results indicated that stress was not significantly related to academic performance which has been found in another study in Saudi Arabia (Abdulghani, et al., 2011).
Partial beta square for depression in WG model was small (.018) and the adjusted $R^2$ for the whole model (.11) was mainly from the other demographic variables.

An interesting finding is that neither SWLS nor GSE was associated with WG. This is similar to 2 studies in the United States that failed to find a significant relationship between academic performance and GSE (Choi, 2005; Mavis, 2001), though it contradicted with an older systemic review (Multon et al., 1991).

This study calls for serious actions to be taken by stakeholders in medical education. It is recommended that universities conduct courses and workshops on coping and study strategies, such as courses tested in other studies (Aboalshamat, et al., 2013), as part of students' support services to vulnerable students. It is also recommended that medical and dental students are provided with access to psychological support by professional during their university studies. Low academic performance may be an indicator of psychological distress.

**Strengths and Limitations**

We believe our study to be the first that investigates the negative and positive aspects of psychological well-being among medical and especially dental students in Saudi Arabia using the instruments mentioned previously. GLM results, which were reported in our study, were more robust and provided more detail than the t-test used in other studies. We also believe that using our formula to calculate WG is better than using the commonly used students’ GPA because WG measured academic performance exclusively to the study period. Our results indicated a novel difference pattern in psychological distress between medical and dental students.

In terms of limitations, the prevalence shown might not be representative of all medical and dental students in Saudi Arabia, but can be representative for the preclinical students in Makkah, as UQU is the only University in Makkah that teach medicine and dentistry. The number of dental students who participated was lower than the number of medical students; however, that was unavoidable given the lower admission rate in dentistry compared with medicine. The study’s data did not provide a justification of why male dental students are more distressed than female dental students. As such, there is need to explore this finding further using a longitudinal national study and a qualitative investigation. A final limitation is the lower response rate. However the response rate was 64.52%, it aligns with similar studies in Saudi Arabia which tend to have wide ranging response rate from 45.5 to 95% (Al-faris, et al., 2012; Soliman, 2013).
In summary, this study found high levels of distress in medical and dentistry students enrolled in UQU, Saudi Arabia, as well as identifying particular subgroups that appear to be more at risk for developing distress. An implication of these findings is the need for more interventional studies to focus on high-risk group university student groups, and that these interventional studies are also needed in Middle Eastern countries such as Saudi Arabia.

Notes on contributors

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Esben Strodl, PhD, is a senior lecturer in psychology at the Queensland University of Technology. His research interests and teaching are in the fields of health and clinical psychology.

Declaration of interest

The authors report no conflicts of interest. The authors are responsible for the content of the article.
References


Chapter 6. Psychological Health of Medical and Dental Students in Saudi Arabia: A Longitudinal Study (Study 3)

Title: Psychological Health of Medical and Dental Students in Saudi Arabia: A Longitudinal Study


Public Health Research is a peer reviewed journal; 5-years Impact Factor: not available.

Date of submission: 26/8/2014

Date of acceptance after revision: 19/9/2014

Contribution of authors: The candidate is the primary author of this study, and was responsible for reviewing the literature, designing the study and directing its implementation, data collecting, data analysis, data interpretation, critical discussion of the findings, and writing the manuscript. The second and third authors were the candidate’s supervisory team and they provided feedback and valuable input on the initial draft of the manuscript.

Implications to the thesis:

This study aimed to evaluate the trajectory of changes in positive and negative aspects of psychological health across time among the target population of this thesis. This study gave an answer to the second question of this thesis by finding that depression, anxiety, stress, and satisfaction with life were improved significantly from the middle of the first term toward the beginning of the second term, among preclinical medical and dental students at Umm Al-Qura University UQU, Makkah, Saudi Arabia. However, the study results showed that self-efficacy did not change significantly. This indicated that the psychological health of the targeted population does vary within the same academic years, and indicated that the time of measurement can be an important factor.
The study also partially answered the third research question of this thesis by giving an indication of the variability between the subgroups. The study results showed in general that the medical, female, and third year students showed greatest improvement, whereas, the dental and second year students were most resistant to change across time. The study indicated that the psychological health among different subgroups might vary across time. All these findings are important for understanding the intervention in the following studies.

**Funding:** None.

**Ethical approval:** Queensland University of Technology (QUT), University Human Research Ethics Committee (UHREC) number 1200000411.

**Conflict of interest:** None.

**Note:** The article in the following pages is the submitted version, and it might be slightly different from the published version.
Chapter 6. The Longitudinal study (Study 3)

Statement of Contribution of Co-Authors for
Thesis by Published Paper

The following is the format for the required declaration provided at the start of any thesis chapter which includes a co-authored publication.

The authors listed below have certified* that:

1. they meet the criteria for authorship in that they have participated in the conception, execution, or interpretation, of at least that part of the publication in their field of expertise;
2. they take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;
3. there are no other authors of the publication according to these criteria;
4. potential conflicts of interest have been disclosed to (a) granting bodies, (b) the editor or publisher of journals or other publications, and (c) the head of the responsible academic unit, and
5. they agree to the use of the publication in the student’s thesis and its publication on the QUT ePrints database consistent with any limitations set by publisher requirements.

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<table>
<thead>
<tr>
<th>Contributor</th>
<th>Statement of contribution*</th>
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</thead>
<tbody>
<tr>
<td>Khalid Aboalshamat</td>
<td>The candidate is the first author of this paper, and was responsible of reviewing the literature, designing the study and directing its implementation, data collecting, data analysing, data interpretation, critical discussing of the findings, and writing the manuscript.</td>
</tr>
<tr>
<td>6/4/2015</td>
<td></td>
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<tr>
<td>Xiang-Yu Hou</td>
<td>The second author and was one of the candidate’s supervisory team. She provided feedback and valuable input on the initial draft of the manuscript.</td>
</tr>
<tr>
<td>Esben Strool</td>
<td>The third author and was one of the candidate’s supervisory team. He provided feedback and valuable input on the initial draft of the manuscript.</td>
</tr>
</tbody>
</table>

Principal Supervisor Confirmation

I have sighted email or other correspondence from all Co-authors confirming their certifying authorship.

Xiang-Yu Hou  6/4/2015

Name  Signature  Date
Psychological health of medical and dental students in
Saudi Arabia: A longitudinal study

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Abstract

Introduction: Many studies have indicated the poor psychological health of medical and dental students. However, few studies have assessed the longitudinal trajectory of that psychological health at different times in an academic year. Aim: To evaluate the positive and negative aspects of psychological health among preclinical medical and dental students in Saudi Arabia prospectively. Methods: A total of 317 preclinical medical and dental students were recruited for a longitudinal study design from second and third-year students at Umm Al-Qura University in the 2012-2013 academic year. The students were assessed at the middle of the first term and followed up after 3-months at the beginning of the second term. Questionnaires included assessment of depression, anxiety, stress, self-efficacy, and satisfaction with life. Results: Depression, anxiety, stress, and satisfaction with life were improved significantly at the beginning of the second term, whereas self-efficacy did not change significantly. The medical, female, and third-year student subgroups had the most significant changes. Depression and stress were significantly changed at the beginning of the second term in most demographic subgroups.

Conclusion: Preclinical medical and dental students have different psychological health levels at different times of the same academic year. It is recommended to consider time of data collection when analyzing the results of such studies.

Keywords
Psychological health, medical students, dental students, dental education, depression, anxiety, stress, self-efficacy, satisfaction with life.
1. Introduction

Multiple systematic reviews have reported unfavorable psychological health status among medical and dental students globally [1-4]. This distress has been suggested to negatively affect the students’ health, professional life, and their patients’ safety [5,6]. Similarly, other measures of psychological health such as perceived stigma have been associated with students’ drop out of medical and dental programs [4,7] which in turn results in a subsequent reduction in the health care workforce.

Many academic factors have been reported to be behind medical and dental students’ poor psychological health, such as a high workload, future study concerns, the long duration of academic days, and a high number of examinations [3,4,8,9]. In addition many students who enroll in medical and dental schools may experience performance pressure in order to do well in their studies due to their desire to satisfy the value of helping others, attain prestigious jobs, and achieve a stable financial future [10,11]. This might explain the high level of psychological distress that accompanies the elevated percentage of satisfaction among medical students [12]. An investigation into these students’ psychological health should therefore include both the positive and negative aspects of their health in order to achieve more wholistic evaluation of psychological health in this population.

The predictors of psychological health in medical and dental students is complex with emerging evidence of moderators of these associations. For example, several studies have highlighted a gender difference in psychological distress levels of depression, anxiety, and stress. These studies have indicated that females were more vulnerable to distress than males [3-5,13]; however, some studies indicated that there were no differences [14,15]. In addition, year of study has been as a possible moderating factor with the evidence still being contradictory. For example, some have suggested that the early years were more distressing [5], whereas others have suggested that distress in the students’ last years was greater [4,16]. Moreover, other studies have highlighted that the discipline being studies may be a moderating factor given that dental students are more distressed [17,18] and less satisfied than medical students [19].

Despite the high number of publications since 2000 on the psychological health of medical and dental students, most were cross-sectional studies. Only a few longitudinal studies were conducted to assess the changes across time; some found that psychological distress [14,20] and life satisfaction [21] deteriorated from the first years to the final years among medical students. A study in the United Kingdom found that the psychological distress was transient during the first academic
year among medical students and did not persist in subsequent years [22]. Few studies have investigated these changes across the same year. A longitudinal study in Malaysia on first-year medical students indicated that they had higher depression, anxiety, and stress levels at final examination time compared with the beginning of the year [23]. However, such findings were not supported by other literature from other countries; investigations of other years or on dental students have not been reported. Furthermore, no longitudinal study has been conducted into the psychological health of medical and dental students in the Middle East.

Thus, the aim of this study was to investigate the change in the psychological health (positive and negative aspects) of Umm Al-Qura University (UQU), Makkah, Saudi Arabia, preclinical medical and dental students prospectively at different times. It also aimed to identify changes over time in psychological health between different demographic subgroups. It was hypnotized that psychological health at the beginning of terms are better than the middle. It was also hypnotized that different subgroups to act differently.

2. Methodology

Both medical and dental program at UQU are six-year programs. The students at both faculties study an orientation (1st) year together with other health specialties (such as pharmacy and nursing). After that, medical and dental students study separately for two preclinical (2nd and 3rd) years, followed by three clinical (4th, 5th, and 6th) years. Each year is composed of two terms. Students at both faculties at UQU take multiple quizzes and examination that start from the 4th-6th week of each term and continue, with intermittent periods free of exams, until term’s final exams.

2.1 Design, Sample and ethics

A longitudinal study-design was used on the preclinical students at both faculties for the 2012-2013 academic year at UQU. Calculating sample size was done using sample size equation for one group and continues outcome [24]. The following values where used; α=0.05, study power 90%, standard deviation =7 as derived from similar study [25], and clinical difference of 4 points. This resulted in 65 participants as the minimal number of participants needed to detect a difference. Different promotional methods were used (poster and personal invitation) to recruit adequate sample size to avoid bias due to lack of power. Selective sampling was used to included all male and female students at the preclinical years at both faculties (654). The students were invited at week 12 of the first term. The exclusion criteria, that included being under psychological treatment
or drugs, were not applied on the students, so all the students were eligible to the study. Reporting this study was compliance with STROBE checklist.

2.2 Study setting

Data were gathered using a self-reported hard-copy questionnaire that was distributed and collected by research assistants twice: first (T1) at the middle of the first term (week 12) after days of minor quizzes, followed up after 3 months (T2) at the first week of the second term. T2 was after the students spent one-week vacation between the two terms. Students at T1 or T2 were not taking any exams or quizzes concurrently. The questionnaires were disseminated and collected by research assistants at breaks between lectures. The questionnaires were reviewed and analyzed by the main investigator. Participants were asked to sign a study consent form. Participants were informed that they would have another follow-up questionnaire, their data would have no influence on their relationship with their faculties or the research team, and that the data would be treated anonymously. The 3 months between T1 and T2 was probably sufficient to avoid recall bias. A number of research assistants were allocated and trained to disseminate and communicate with participants in a uniform and organized manner to avoid attrition bias. Ethical approval was obtained from Queensland University of Technology (QUT) in Australia, and from the medical and dental faculties at UQU in Saudi Arabia.

2.3 Outcomes and instruments

The self-reported questionnaire assessed the students’ positive and negative psychological health aspects (depression, anxiety, stress, life satisfaction and self-efficacy) using three scales. The first was the Depression Anxiety Stress Scale (DASS-21) [26,27] in its Arabic version [28]. DASS-21 is a 21-question scale that is comprised of 7 questions that are summed for each subscale of depression, anxiety and stress. DASS-21 has good psychometric properties, with reliability coefficients ranging from 0.82 to 0.90 in each subscale [26]. The second was the Satisfaction With Life Scale (SWLS) [29], which measures satisfaction with life; an Arabic version employed in a previous study was used [30]. SWLS is a five-question scale that also has good psychometric properties with a reliability coefficient of 0.87. The third was the General Self-Efficacy scale (GSE) [31], which measures self-efficacy within students; this GSE was used in its Arabic version [32]. GSE is a 10-question scale that has been tested in 25 nations and has good psychometric properties, with a reliability coefficient of 0.86. DASS-21 was used to measure the negative aspects of psychological health, whereas SWLS and GSE were used to assess the positive aspects. These instruments have excellent psychometric properties and were chosen to avoid instrument bias.
Demographic questions were potential effect modifiers and confounding, and were included for department, gender, year of study, family income, marital status, and nationality.

2.4 Statistical analysis

Data were analyzed using SPSS software version 21. Frequency tables were generated for the descriptive data. T-test and chi-square test were used to compare between the study participants and the students who dropped out of the study. Paired t-tests were used to analyze the change in depression, anxiety, stress, GSE, and SWLS means between T1 and T2. Subgroup analyses involved using paired t-tests to compare changes between T1 and T2 across faculty (medical/dental), gender, year of study, and family income. Only students who completed the questionnaires at T1 and T2 were analyzed. Level of significance was measured as $p < 0.05$ for all tests. Students who dropped out of the study at T2 were not included in the statistical analysis of this study. Very few values were missing (overall less than 0.1%). Expectation maximization (EM) method were used to replace missing values.

3. Result

Only (422) of the invited students accepted to participate, resulting in 64.52% response rate. This might be because the students’ were not willing to participate in a study with follow up, especially when they at study time. Of these, (317) completed the follow-up, yielding a 24.88% dropout rate. The drop out can be explained by the students’ failure to return follow up in the specific time. The 317 students formed the sample size of this study; of these, 81.7% were medical students. Females represented 54.6% and third-year students represented 51.4% of the cohort; 66.2% had a family income of more than 10,000 Saudi Riyals (2,667 USD); only 1.9% were non-Saudi; and 2.2% were married (Table 1). The Students’ ages ranged between 20 and 22 years.
**Table 1:** Demographic profile of 317 medical and dental students participating in the study.

<table>
<thead>
<tr>
<th>Demographic Variable</th>
<th>Number of Participants (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty</td>
<td></td>
</tr>
<tr>
<td>Medical</td>
<td>259 (81.7%)</td>
</tr>
<tr>
<td>Dental</td>
<td>58 (18.3%)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>144 (45.4%)</td>
</tr>
<tr>
<td>Female</td>
<td>173 (54.6%)</td>
</tr>
<tr>
<td>Studying year</td>
<td></td>
</tr>
<tr>
<td>Second</td>
<td>154 (48.6%)</td>
</tr>
<tr>
<td>Third</td>
<td>163 (51.4%)</td>
</tr>
<tr>
<td>Family income</td>
<td></td>
</tr>
<tr>
<td>Low (&lt;10,000 SR)</td>
<td>107 (33.8%)</td>
</tr>
<tr>
<td>High (&gt;10,000 SR)</td>
<td>210 (66.2%)</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>310 (97.8%)</td>
</tr>
<tr>
<td>Married</td>
<td>7 (2.2%)</td>
</tr>
<tr>
<td>Nationality</td>
<td></td>
</tr>
<tr>
<td>Saudi</td>
<td>311 (98.1%)</td>
</tr>
<tr>
<td>Non-Saudi</td>
<td>6 (1.9%)</td>
</tr>
</tbody>
</table>

Abbreviation: SR, Saudi Riyals.

There was no statistical difference in psychological outcomes (using t-tests) and the demographic variables (using chi-square) between the study participants who completed the questionnaires at T1 and T2, and the students who dropped out of the study.

Depression, anxiety, and stress were significantly lower at the beginning of the second term at T2 than the middle of first term at T1, as shown in Table 2. Satisfaction with life was significantly higher while there was not change in general self-efficacy.

In Table 3, depression, anxiety, and stress were reduced in all demographic subgroups (medical, dental, male, female, second-year, third-year, and high and low family income students). Depression was reduced significantly among all the subgroups shown in Table 3 except the second-year students. Stress was also reduced significantly among all the subgroups shown in Table 3 except for dental students. Anxiety level reduction was significant only among the medical, female, third-year, and low family income students. General self-efficacy showed no significant change occurred in any subgroups (Table 3). All the demographic subgroups showed increased satisfaction with means at T2; however, the largest increase was found in the medical, dental, female, third-year, and high family income students.
Table 2: Depression, anxiety, stress, GSE, and SWLS mean scores at T1 and T2 in the preclinical years of UQU medical and dental students.

<table>
<thead>
<tr>
<th>Score</th>
<th>Mean (SD)</th>
<th>Mean difference</th>
<th>95% CI</th>
<th>t (df)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>15.15 (9.06)</td>
<td>2.61</td>
<td>1.68, 3.52</td>
<td>5.56 (316)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>T2</td>
<td>12.54 (9.35)*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>12.18 (9.07)</td>
<td>1.54</td>
<td>0.66, 2.40</td>
<td>3.48 (318)</td>
<td>0.001</td>
</tr>
<tr>
<td>T2</td>
<td>10.64 (8.82)*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stress</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>T1</td>
<td>20.72 (8.91)</td>
<td>4.29</td>
<td>3.32, 5.26</td>
<td>8.72 (318)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>T2</td>
<td>16.43 (9.47)*</td>
<td></td>
<td></td>
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<tr>
<td>GSE</td>
<td></td>
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<tr>
<td>T1</td>
<td>27.15 (4.78)</td>
<td>−0.15</td>
<td>−0.53, 0.23</td>
<td>−0.77 (316)</td>
<td>0.442</td>
</tr>
<tr>
<td>T2</td>
<td>27.30 (4.45)</td>
<td></td>
<td></td>
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<tr>
<td>SWLS</td>
<td></td>
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</tr>
<tr>
<td>T1</td>
<td>23.37 (6.31)*</td>
<td>−0.85</td>
<td>−1.41, −0.28</td>
<td>−2.95 (316)</td>
<td>0.003</td>
</tr>
<tr>
<td>T2</td>
<td>24.22 (6.34)</td>
<td></td>
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</tbody>
</table>

Abbreviations: CI, confidence interval; df, degrees of freedom; GSE, General Self-Efficacy scale; p, p value of paired t-test; SD, standard deviation; SWLS, Satisfaction With Life Scale; T1, middle of first semester; T2, beginning of the second semester.

*p< 0.05.
**Table 3:** Demographic subgroups associated with depression, anxiety, stress, GSE, and SWLS scores at T1 and T2 in the preclinical years for UQU students.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>Faculty</strong></td>
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</tr>
<tr>
<td>Medicine (259)</td>
<td>T1</td>
<td>14.98 (9.03)</td>
<td>2.56*</td>
<td>12.22 (9.27)</td>
<td>1.57*</td>
<td>20.8 (8.99)</td>
<td>4.81*</td>
<td>27.17 (4.85)</td>
<td>0.12</td>
<td>23.2 (6.49)</td>
<td>−0.73*</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>12.42 (9.48)</td>
<td>10.64 (8.89)</td>
<td>15.99 (9.68)</td>
<td>27.29 (4.55)</td>
<td>23.93 (6.54)</td>
<td>10.64 (8.89)</td>
<td>27.29 (4.55)</td>
<td>23.93 (6.54)</td>
<td>23.93 (6.54)</td>
<td>23.93 (6.54)</td>
</tr>
<tr>
<td>Dentistry (58)</td>
<td>T1</td>
<td>15.93 (9.23)</td>
<td>2.83*</td>
<td>12.03 (8.23)</td>
<td>1.38</td>
<td>20.41 (8.66)</td>
<td>2.01</td>
<td>27.12 (4.53)</td>
<td>−0.28</td>
<td>24.16 (5.46)</td>
<td>−1.36*</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
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<tr>
<td>Male (144)</td>
<td>T1</td>
<td>14.71 (9.05)</td>
<td>2.88*</td>
<td>10.76 (7.99)</td>
<td>0.64</td>
<td>19.36 (9.08)</td>
<td>3.77*</td>
<td>27.59 (4.82)</td>
<td>−0.14</td>
<td>23.49 (5.98)</td>
<td>−0.7</td>
</tr>
<tr>
<td>Female (173)</td>
<td>T1</td>
<td>15.53 (9.08)</td>
<td>2.38*</td>
<td>13.36 (9.75)</td>
<td>2.29*</td>
<td>21.86 (8.65)</td>
<td>4.74*</td>
<td>26.8 (4.74)</td>
<td>−0.16</td>
<td>23.28 (6.6)</td>
<td>−0.97*</td>
</tr>
<tr>
<td><strong>Studying year</strong></td>
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<tr>
<td>Second (154)</td>
<td>T1</td>
<td>14.01 (8.78)</td>
<td>0.89</td>
<td>11.47 (8.49)</td>
<td>0.68</td>
<td>20.05 (9.04)</td>
<td>3.22*</td>
<td>26.92 (4.67)</td>
<td>0.05</td>
<td>24.66 (5.78)</td>
<td>−0.35</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>13.12 (9.62)</td>
<td>10.79 (8.91)</td>
<td>16.84 (9.49)</td>
<td>26.86 (4.52)</td>
<td>25.01 (5.85)</td>
<td>25.01 (5.85)</td>
<td>25.01 (5.85)</td>
<td>25.01 (5.85)</td>
<td>25.01 (5.85)</td>
<td>25.01 (5.85)</td>
</tr>
<tr>
<td>Third (163)</td>
<td>T1</td>
<td>16.23 (9.22)</td>
<td>4.22*</td>
<td>12.86 (9.57)</td>
<td>2.35*</td>
<td>21.36 (8.78)</td>
<td>5.31*</td>
<td>27.39 (4.89)</td>
<td>−0.34</td>
<td>27.73 (4.66)</td>
<td>−1.32*</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>12.01 (9.09)</td>
<td>10.51 (8.77)</td>
<td>16.05 (9.48)</td>
<td>27.73 (4.36)</td>
<td>23.48 (6.72)</td>
<td>23.48 (6.72)</td>
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<td>23.48 (6.72)</td>
<td>23.48 (6.72)</td>
<td>23.48 (6.72)</td>
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<tr>
<td><strong>Family income</strong></td>
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</tr>
<tr>
<td>Low (107)</td>
<td>T1</td>
<td>15.44 (9.62)</td>
<td>2.76*</td>
<td>13.93 (9.85)</td>
<td>2.76*</td>
<td>21.44 (8.63)</td>
<td>4.09*</td>
<td>26.84 (5.13)</td>
<td>−0.27</td>
<td>23.06 (6.71)</td>
<td>−0.67</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>12.68 (10.07)</td>
<td>11.16 (9.29)</td>
<td>17.35 (9.73)</td>
<td>27.11 (4.82)</td>
<td>23.73 (6.89)</td>
<td>23.73 (6.89)</td>
<td>23.73 (6.89)</td>
<td>23.73 (6.89)</td>
<td>23.73 (6.89)</td>
<td>23.73 (6.89)</td>
</tr>
<tr>
<td>High (210)</td>
<td>T1</td>
<td>15.01 (8.78)</td>
<td>2.53*</td>
<td>11.3 (8.54)</td>
<td>0.91</td>
<td>20.36 (9.06)</td>
<td>4.4*</td>
<td>27.32 (4.6)</td>
<td>−0.09</td>
<td>23.54 (6.12)</td>
<td>−0.94*</td>
</tr>
</tbody>
</table>

Abbreviations: M, mean; SD, standard deviation; Anx., anxiety; dep., depression; diff., mean difference; GSE, General Self-Efficacy scale; Str, stress; SWLS, Satisfaction With Life Scale; T1, middle of first semester; T2, beginning of the second semester.*p < 0.05
4. Discussion

Depression, anxiety, and stress status were significantly lower at T2 for the students overall, indicating an improvement in the negative aspect of psychological health. This also indicates that students at the middle of years taking classes, exams, and quizzes might manifest a higher distress in compared to beginning of a new term after having one-week vacation. It also agrees with a previous study in Malaysia that finds that depression, anxiety, and stress at the beginning of a term are lower than during or at the end of a term [23]. In addition to the reduction in negative aspect, the students also experienced an increase in satisfaction with life at the start of the second term supporting the view that mid-term vacations are important in rejuvenating university students.

On the other hand, general self-efficacy did not change significantly between T1 and T2, and neither was any demographic subgroup associated with significant changes in GSE level. It is therefore possibly the insignificance of our results might be because the short time between the T1 and T2 (3 months) did not provide enough academic experience or time in the course unit to elevate GSE level.

More specifically the findings of the study also suggest that there were significant differences in psychological health among the demographic subgroups such as department, gender, year of study, and family income. Neither nationality nor marital status were included in the statistics because of the low number of non-Saudi (6) and married students (7). We identified four patterns in changes in psychological health based on changes in depression, anxiety, stress and satisfaction for life. First, medical, third year, and female subgroups had larger improvements in depression, anxiety, stress, and satisfaction with life between T1 and T2 than dental, 2nd year and male subgroups.

Second, several significant results found in medical students were not significant in dental students (e.g. anxiety and stress scores) despite direction of means being consistent across groups. It is likely this is due to differences in sample size of the two groups perhaps rather than anything intrinsic to the groups themselves. However, the presence of persistent anxiety levels among dental students has another potential explanation as UQU Dental Faculty is newly established, meaning there is continuous reform in the curriculum and academic environment that could potentially increase students’ anxiety about unknown challenges. Also, Silverstein indicates in her longitudinal study that stress level changes differently among different dental schools [33] which could be another suggested explanation to our finding in terms of stress.
Third, we noticed that second-year students’ psychological health did not improve except in terms of stress levels, while third year students’ psychological health improved in terms of depression, anxiety, stress, and life satisfaction. This might indicate that third-year students suffer from more challenges and distress, as indicated in another study [34]. The significant reduction in stress level in both years can be justified as quizzes and examinations, which might increase students stress especially, are more frequent in the middle of terms than the beginning.

Last, depression and stress level were reduced at all the demographic subclasses, unlike anxiety and SWLS. Anxiety and SWLS seem to be sensitive to gender, year of study, and family income. Male and second-year students had no improvement in anxiety or satisfaction levels at T2. In regard to income, low family income students had a significant reduction in anxiety in contrast with high-income students. This might be due to financial burden of expenses during the term. On the other hand, high family income students had a significant increase in SWLS, unlike low family income students. This is may be because high family income students can spend extra money to enjoy their time at the beginning of the year in contrast to low-income students.

This study had the following strengths: 1) the prospective study design. 2) There were very few missing data and dropout percentages. 3) There was no demographical or psychological difference between the our sample and dropped out students. Also, 4) The instruments used in this study had good psychometric properties and have been widely used in different cultures.

On the other hand, caution needs to be taken in generalizing the results of this study to all preclinical medical and dental students in Saudi Arabia because the study was conducted in UQU only. Participating was based on self-selection and so was not random-based. Also, medical and dental students ratio was not equivalent. However, this was unavoidable due to the low number of dental students positions in compared to medical students in UQU.

5. Conclusion

The general improvement in our results in psychological health (depression, anxiety, stress, and satisfaction) constructs suggests that the medical and dental students experience different educational environment along the terms. The multiple examinations in the middle of the term is suggested to be an important distressful factor in compare to the beginning of a term. Our results also suggest that the student are rejuvenated by vacation breaks between terms and emphasizes the importance of such breaks in promoting the psychological health of medical and dental students. This also drew an implication on the majority of the cross sectional studies on psychological health
among medical and dental students, as the differences in the cross-sectional results might be because of different data collection time. Students with different gender, faculty, financial status and academic year might response differently to each psychological construct. This should be taken in consideration when designing or analyzing future studies on such population.

Acknowledgement

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References


Chapter 6. The Longitudinal Study (Study 3)


Chapter 7. Improving Medical and Dental Students’ Psychological Health Using a Self-Development Coaching Program: A Pilot Study (Study 4)

Title: Improving Dental and Medical Students’ Psychological Health Using a Self-Development Coaching Program: A Pilot Study.


*Journal of Advanced Medical Research* is a peer reviewed journal; 5-years Impact Factor: not available.

Date of submission: 18/7/2013

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Contribution of authors: The candidate is the primary author of this study, and was responsible for reviewing the literature, designing the study and directing its implementation, data collecting, data analysis, data interpretation, critical discussion of the findings, and writing the manuscript. The second and third authors were the candidate’s supervisory team and they provided feedback and valuable input on the initial draft of the manuscript.

Implications to the thesis:

This study aimed to evaluate the conductibility of a planned, randomised, controlled, trial RCT, using the self-development coaching program, “How to Be an Ultra Super Students” with the targeted population of the thesis. This study helped to answer the fourth and fifth questions of the thesis. It showed a high level of feasibility and conductibility of the interventional protocol and revealed some practical modifications that should be made for the main RCT.
This study also provided some preliminary findings to support the effectiveness of the designated program with respect to some psychological factors among clinical-year medical students in Umm Al-Qura University (UQU), Makkah, Saudi Arabia. The students showed a moderate size effect improvement in depression and a small size effect improvement in self-efficacy and satisfaction with life. No improvement was found in stress or anxiety levels. It also showed that the students rated all the measured characteristics of the coaching program and coach at above the mid-point.

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**Ethical approval:** Queensland University of Technology (QUT), University Human Research Ethics Committee (UHREC) number 1200000411.

**Conflict of interest:** None.

**Note:** The article in the following pages is the submitted version, and it might be slightly different from the published version.
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<td>Khalid Aboalshamat</td>
<td>The candidate is the first author of this paper, and was responsible of reviewing the literature, designing the study and directing its implementation, data collecting, data analysing, data interpretation, critical discussing of the findings, and writing the manuscript.</td>
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<td>6/4/2015</td>
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<tr>
<td>Xiang-Yu Hou</td>
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<td>The third author and was one of the candidate’s supervisory team. He provided feedback and valuable input on the initial draft of the manuscript.</td>
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</table>

Principal Supervisor Confirmation

I have sighted email or other correspondence from all Co-authors confirming their certifying authorship.

Name: Xiang-Yu Hou  
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Improving Dental and Medical Students’ Psychological Health using a Self-Development Coaching Program: A Pilot Study

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Abstract

Introduction: Dental and medical students worldwide, including in Saudi Arabia, have been reported to have a high incidence of poor psychological health, such as depression, stress, anxiety, and low life satisfaction. Self-development coaching programs have become an increasingly popular way to improve individuals’ lives. However, few studies have evaluated the psychological effects of such programs among dental and medical students. Moreover, no studies have been conducted on self-development coaching programs in Saudi Arabia.

Aims: The aim of this study was to assess the feasibility of a larger study via a pilot study and to acquire preliminary findings about the effectiveness of a self-development coaching program on psychological health among dental and medical students in Saudi Arabia.

Methods: A pre-post interventional study design was used to test a self-development coaching program (How to be an Ultra-Super Student) with a sample of medical students (n=17) at Umm Al-Qura University at Saudi Arabia. The outcome measures were students’ psychological distress (depression, anxiety, and stress), life satisfaction, self-efficacy, the coach, and coaching program characteristics.

Results: The study showed that there was a significant improvement in depression (p=0.04), self-efficacy (p=0.02), and satisfaction with life (p=0.04), which supported the feasibility of a large study in the future.
Conclusions: The study’s findings encourage the implementation of a randomized, controlled trial study with a larger sample to further test the effectiveness of using self-development coaching programs with medical and dental students in Saudi Arabia to improve their psychological health.

Keywords: self-development, coaching, medical students, dental students, psychological health, Saudi Arabia

1. Introduction

Psychological health disturbances are well-documented among undergraduate dental and medical students worldwide (Alzahem, Van Der Molen, Alaujan, Schmidt, & Zamakhshary, 2011; Dyrbye et al., 2007; Dyrbye et al., 2009; Henning, Hawken, & Hill, 2009; Jurkat, Höfer, Richter, Cramer, & Vetter, 2011), including in Saudi Arabia (Abdulghani, AlKanhal, Mahmoud, Ponnamperuma, & Alfaris, 2011; Al-Saleh, Al-Madi, Al-Angari, Al-Shehri, & Shukri, 2010). In fact, the psychological health of these students is worse in comparison to students from other faculties and the general population (Dahlin, Joneborg, & Runeson, 2005; Dyrbye, et al., 2007; Mane Abhay, Krishnakumar, Niranjan Paul, Hiremath Shashidhar, & Mane, 2011). Many studies have indicated the presence of high levels of stress, depression, and anxiety and low levels of self-efficacy among dental and medical students (Alzahem, et al., 2011; Dyrbye, Thomas, & Shanafelt, 2006; Jurkat, et al., 2011; Polychronopoulou & Divaris, 2005). A number of factors have been found to be associated with the psychological health status of these students, including academic performance (Roh, Jeon, Kim, Han, & Hahm, 2010), academic year (Dahlin, et al., 2005), and gender (Dahlin, et al., 2005; Dyrbye, et al., 2006). Given the current global shortage of health care providers (Scheffler, Liu, Kinfu, & Dal Poz, 2008), it is important to explore the psychological distress that might be linked with medical and dental practitioners’ iatrogenic malpractice (Halbesleben & Rathert, 2008).

Self-development coaching programs are growing in popularity as a practice to improve psychological health (Fernros, Furhoff, & Wändell, 2008; Holzinger, Matschinger, & Angermeyer, 2011; Stein, 2010; Yentob, 2008). Given the relatively short period of time during which these types of interventions have been emerging in the research arena, there is still some debate over the definition of self-development coaching programs. Self-development coaching is defined in this paper as an interactive, multidimensional human developmental process, mainly between non-clinical coachees and a trusted coach who has a number of characteristics to facilitate an
individual’s life improvement, which could extend sub-sequentially to the organization, in fields valued by the coachee, using a combination of proven and unproven techniques and concepts. Studies have indicated a number of characteristics of the coach and coaching program that are important to the outcome of these programs. These characteristics include empathy (Hall, Otazo, & Hollenbeck, 1999; Lucock, Barber, Jones, & Lovell, 2007), confidence, using the coach’s personal experience (Hall, et al., 1999), persuasiveness (Bergsma, 2008; Nathan, 2011), ability to get the audience’s attention back (Richardson, Richards, & Barkham, 2008; Walters, 1993), being able to influence coachees’ emotions (Passmore, 2008), acting as a role model, and increasing coachees’ motivational levels (Bass & Avolio, 2000). In addition, other studies have highlighted factors related to the program itself, including the program's relevance to the coachee (Beckert, Wilkinson, & Sainsbury, 2003), the coachee’s level of experience with the content of the program (Bandura, 1997), and the coachee’s level of satisfaction with the program (Schmidt, 2007).

To date, only a few studies have investigated the effectiveness of self-development coaching programs on students’ psychological health. An interventional study conducted by Holm, Tyssen, Stordal, and Haver (2010) indicated that self-development groups for medical students can reduce their stress levels. In addition, Fernros et al., (2008) assessed the effects of a self-development program in Sweden on adults and found a significant improvement in most of the health-related quality of life domains, including emotional well-being. Moreover, a number of interventional studies found that interventional coaching has a positive impact on improving psychological health constructs, such as depression, stress, and anxiety (Anthony Grant, 2001, 2003; A. Grant, Curtayne, & Burton, 2009).

However, the findings from these studies were not consistent among different psychological indices. For example, stress, depression, and anxiety were found to be improved by life coaching in Grant’s study (2003), while in another study, anxiety did not improve, and there was no clear impact on stress and depression (A. Grant, et al., 2009). In addition, most of the interventional coaching studies have assessed self-development programs designed for research purposes and have not assessed commercial self-development coaching programs running concurrently. So far, the study by Holm et al. is the only published study that has investigated self-development programs with medical students. In addition, there are no published studies that have evaluated self-development coaching programs in Saudi Arabia.

This pilot study, therefore, aims to provide some preliminary data on the effectiveness of an existing self-development coaching program on the psychological health of medical and dental

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students in Saudi Arabia. Associated with this, the study aims to explore the feasibility of a larger, randomized control trial to test the effectiveness of this existing self-development program by exploring the effectiveness of the study protocol, measurement, and recruitment processes.

2. Methodology

2.1 Program Setup

The main investigator formed a team consisting of one experienced event organizer to supervise the team and 16 dental and medical students as voluntary research assistants. The research assistants and participants were from the same faculties, in order to facilitate conducting the program and the follow up. The author met with the team members and explained in detail the aims, process, tasks, and timeframe of the project, as well as the consent information, so they would be able to answer any questions during the recruiting process. Tasks were distributed among the team members, and an electronic communication medium was set up between the author and the team. A male leader and a female leader were assigned to the team to take into account the religious–cultural gender segregation regulation of the Saudi population. A lecture room at the Umm al-Qura Charity Society Women was booked in the Holy City of Makkah to conduct the study. A video camera was installed to record only the coach on the stage, for intervention fidelity purposes. In accordance with Saudi religious–cultural gender segregation regulations, a physical barrier was used to separate the male and female participants during the program. In addition, a catering service was organized for all attending participants. On the day of the program, each participant was given a plastic folder that containing the program’s booklet, a pen, a double-head color pen, post-it notes, and the program's CD. Research assistants kept an attendance list for accessibility.

2.2 Sample

A convenience sample was recruited from Umm Al-Qura University, Saudi Arabia; only 4th, 5th, and 6th year students in the medical faculty were asked to participate. According to Julious (2005), 12 participants were needed as the sample size of this pilot study. Recruiting was conducted by the research assistants, by extending personal invitations to their colleagues. Forty-nine participants (20 males, 29 females) registered manually to attend. The registered females were mainly 4th year students.
2.3 The Intervention: “How to Be an Ultra-Super Student”

“How to Be an Ultra-Super Student” is a self-development coaching program, developed in 2008 as a combination of the founding coach’s personal experiences and the coach’s research of relevant commercial self-development books. Since then, the program has undergone continuous modification and refinement, using participants’ feedback and self-development books and resources. The program aims to improve the academic performance and psychological health of students. It is a two-day face-to-face program, lasting six hours each day. The program is composed of a live course, the program’s booklet, and the program’s CD. The live course portion, conducted face-to-face between the coach and the participants, is where the coach delivers the program’s modules as a verbal presentation, interacts with the participants, and helps the participants use the program’s exercises. The coach delivered the program’s modules in the following order: 1) Unleash your inner power; 2) Manage your time effectively; 3) The maximum usefulness of universities’ lectures; 4) How to study and memorize effectively; 5) Dealing with exams; and 5) Religious teachings. The booklet contains the program’s material in written format. The CD contained 24 motivational and two muscle relaxation audio files to be used after the program. A number of methods were used to facilitate delivery of the program, such as using a motivational tone of voice; relating success stories (parables); showing movie clips; interacting directly with the audience; giving the coachees the freedom to choose among the program’s techniques for those that fit achieving their goals; sharing the coach’s personal expertise; clapping and cheering during the course; and using famous people’s quotes (metaphor). The main author was the coach who implemented the self-development coaching program in this study. The authors were blind to the data collection and data entry, which were conducted by the research team. As such, the authors could only access de-identified data post-intervention for analysis.

2.4 Measurement

The participants were assessed twice: immediately before the program (T1) and one week after the program (T2). The self-development coaching program was held in week 11 of the first semester of the 2012–2013 academic year, over 12 hours on two days. The middle of the semester was selected as the most appropriate time, considering the consecutive exams and quizzes the participants had to take in their regular classes. All of the program’s details, including dates, times, location, and procedures, were listed in the consent form when the participants signed on.

The participants were assessed with a questionnaire administered in hard-copy format. The following variables were assessed. The negative spectrum of psychological health was assessed by

measuring depression, anxiety, and stress, using the Depression Anxiety Stress Scale (DASS-21) (P. Lovibond & Lovibond, 1995). The positive spectrum of psychological health was assessed using the General Self-Efficacy scale (GSE) (Schwarzer & Jerusalem, 1995) and Satisfaction With Life Scale (SWLS) (Diener, Emmons, Larsen, & Griffin, 1985). In addition, the Credibility and Expectancy Questionnaire (CEQ) was included to explore how credible the participants found the program and what their expectations were for the impact of the program upon their lives, before and after participating in the program (Devilly & Borkovec, 2000). Moreover, a number of coach and coaching program characteristics, derived from a review of the literature, were included for measurement in this study. Finally, demographic data were collected, including gender, faculty, academic year, marital status, family income, and nationality.

All of the measures were assessed pre- and post-intervention, except coach and coaching programs characteristics, which were assessed only after the intervention. The DASS21 and GSE already had published Arabic versions, which were used in this study (Scholz, Doña, Sud, & Schwarzer, 2002; Taouk, Lovibond, & Laube, 2001). The other questionnaires and questions were translated into Arabic using World Health Organization (WHO) translation guidelines (WHO, 2013).

2.5 Ethics and Incentives

Ethical approval was obtained from Queensland University of Technology (number 1200000411). The course was provided free of charge as an encouragement to attend; the course usually costs 300 SR (USD80) per person. The participants also received a certificate of attendance signed by the authors after the program.

3. Results

Seventeen participants (13 males, four females) attended the two-day program, and all 17 completed both questionnaires at T1 and T2. Participant details are shown in Table 1.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Participants’ demographic data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>n</td>
</tr>
<tr>
<td>Male</td>
<td>13</td>
</tr>
<tr>
<td>Female</td>
<td>4</td>
</tr>
<tr>
<td>Year</td>
<td></td>
</tr>
<tr>
<td>4th year</td>
<td>14</td>
</tr>
<tr>
<td>6th year</td>
<td>3</td>
</tr>
<tr>
<td>Nationality</td>
<td>17</td>
</tr>
</tbody>
</table>

Chapter 7. The Pilot Study (Study 4)
The mean DASS21, GSE, and SWLS scores before (T1) and after (T2) the self-development program, as well as the differences in scores, are shown in Table 2. Paired t-test analysis was used to detect significant differences within subjects, and Cohen’s D was used to measure effect size (ES), where 0.3 indicates small effect, 0.6 is medium effect, and 0.8 indicates large effect (Cohen, 1988).

Table 2

Mean scores, significance, and Cohen’s D effect size in Depression, Anxiety, and Stress (DASS), General Self-Efficacy (GSE), and Satisfaction with Life (SWLS) of the pilot study

<table>
<thead>
<tr>
<th></th>
<th>T1 mean (CI: 95%)</th>
<th>SD</th>
<th>T2 mean (CI: 95%)</th>
<th>SD</th>
<th>p-value</th>
<th>Cohen’s D effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n= 17</td>
<td></td>
<td>n=17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>13.05 (8.6-17.4)</td>
<td>8.63</td>
<td>8.00 (4.3-11.6)</td>
<td>7.03</td>
<td>0.04</td>
<td>0.59</td>
</tr>
<tr>
<td>Anxiety</td>
<td>6.23 (3.2-9.2)</td>
<td>5.82</td>
<td>5.885 (2.6-9.1)</td>
<td>6.26</td>
<td>0.83</td>
<td>0.06</td>
</tr>
<tr>
<td>Stress</td>
<td>16.00 (11.1-20.8)</td>
<td>9.48</td>
<td>12.11 (7.3-16.9)</td>
<td>9.36</td>
<td>0.12</td>
<td>0.41</td>
</tr>
<tr>
<td>General Self-Efficacy</td>
<td>29.41 (26.9-31.8)</td>
<td>4.7</td>
<td>31.41 (29.0-33.8)</td>
<td>4.66</td>
<td>0.02</td>
<td>0.43</td>
</tr>
<tr>
<td>Satisfaction with Life</td>
<td>23.00 (20.0-25.9)</td>
<td>5.74</td>
<td>25.05 (21.9-28.1)</td>
<td>6.06</td>
<td>0.04</td>
<td>0.36</td>
</tr>
<tr>
<td>Credibility</td>
<td>20.05 (17.4-22.6)</td>
<td>5.11</td>
<td>21.05 (18.3-23.7)</td>
<td>5.23</td>
<td>0.48</td>
<td>0.2</td>
</tr>
<tr>
<td>Expectancy</td>
<td>19.23 (16.4-22.0)</td>
<td>5.37</td>
<td>17.52 (14.6-20.3)</td>
<td>5.51</td>
<td>0.14</td>
<td>0.31</td>
</tr>
</tbody>
</table>

Depression scores declined significantly from pre- to post-intervention (p=0.044), with moderate effect size (ES=0.59). Anxiety and stress levels did not change significantly within subjects (anxiety, p=0.83; stress, p=0.129). General self-efficacy scores increased significantly (p=0.022), with small effect size (ES=0.43). Satisfaction with life scores increased significantly (p=0.044), with small effect size (ES=0.36). Credibility and expectancy did not show any significant change between T1 and T2.
Table 3 presents descriptive statistics regarding the coach and coaching program characteristics’ means, standard deviation, and item correlation with the overall scale. All of the factors were scored higher than the mid-point (>5). Assessing the internal consistency resulted in a Cronbach’s alpha of 0.93, which indicates high internal consistency.

Table 3
Coach and coaching program characteristics: means, standard deviation, and items correlation with other items of the pilot study

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>Items correlation with other items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coachee satisfaction with the program</td>
<td>7.35</td>
<td>1.53</td>
<td>.807</td>
</tr>
<tr>
<td>Using personal experience of the coach</td>
<td>8.47</td>
<td>1.58</td>
<td>.798</td>
</tr>
<tr>
<td>Coaching program relevance</td>
<td>7.76</td>
<td>1.75</td>
<td>.934</td>
</tr>
<tr>
<td>Coach’s ability to get coachee’s attention</td>
<td>8.47</td>
<td>1.66</td>
<td>.931</td>
</tr>
<tr>
<td>Coach confidence</td>
<td>9.17</td>
<td>1.38</td>
<td>.878</td>
</tr>
<tr>
<td>Coach as a role model</td>
<td>7.35</td>
<td>2.02</td>
<td>.778</td>
</tr>
<tr>
<td>Having experience in the coach’s program content</td>
<td>6.35</td>
<td>1.86</td>
<td>.741</td>
</tr>
<tr>
<td>Coach convincing level</td>
<td>7.58</td>
<td>1.83</td>
<td>.942</td>
</tr>
<tr>
<td>Coach motivation level</td>
<td>8.00</td>
<td>1.69</td>
<td>.849</td>
</tr>
<tr>
<td>Coach ability to influence the coachee emotional</td>
<td>6.88</td>
<td>2.71</td>
<td>.884</td>
</tr>
<tr>
<td>Coach empathy</td>
<td>8.41</td>
<td>1.50</td>
<td>.836</td>
</tr>
</tbody>
</table>

4. Discussion

4.1 Study protocol

The study protocol was conducted in a professional manner. However, a number of adjustments should be included in the further, larger study to facilitate the study process. These adjustments include the following. 1) Conduct the program for five hours each day instead of six hours, for a total of ten hours. This was founded to be feasible, with the same quality and integrity of the program, and it will be more convenient for participants and the research team. 2) Emphasize the importance of on-time compliance with the participants during recruiting to overcome their cultural time-tolerance. 3) Select a different lecture room and gender barrier that will be compatible with a future large number of participants.
Regarding participant recruitment, it should be highlighted that all of the participants in this study were medical students. This is because the study program time was not convenient for most dental students, given their condensed lecture/exam schedule, despite efforts to accommodate them. The challenges in recruiting dental students were exacerbated by the relatively low number of dental students enrolled in the dental faculty compared to the medical student faculty. While dental and medical students share many features, including the academic duration of their degrees and the common courses and units, especially in the basic science years, the results of this study make it clear that extra recruitment considerations and strategies are required for future studies that aim to include Saudi Arabian dental students in their samples. Conducting the study intervention during the first week of the semester is strongly suggested to counteract the condensed lecture/exam schedule when recruiting from dental and medical faculties. In addition, all dental students should be invited in order to compensate for the low student enrollment.

4.2 Participants

Of the 49 invitations originally extended, 17 participants attended the program, yielding a 34.7% response rate (70% among males and 10.34% among females). However, this response rate was expected, as the 49 invitations aimed to overcome the expected non-response rate, drop-out rate, and design effect, as the required sample size was 12 participants. Nevertheless, the low response rate among females was not expected, but it might be attributed to a pop quiz that registered female students had to take. To improve recruiting, it is recommended that personal invitation letters should be disseminated among medical and dental students, and that large banners should be placed in both faculties to advertise participation in the study.

Another interesting point is that there was a zero drop-out percentage in this study. This can be explained by the organized efforts of the research assistants, the small number of participants, and because the research assistants and participants were from the same faculties, thereby facilitating their communication. However, the research assistants had to expend a lot of effort following up. It is suggested that the participants should not receive their certificates until they return all of the follow up questionnaires to the research team. This will facilitate the data collection and multiple follow up waves' processes when involving with a larger sample.

4.3 Outcomes

When comparing the baseline data (T1) of this study to the published norms (Table 4), we found that our sample’s mean score for depression was above the norm for community groups and
above the mean for clinical samples (S. Lovibond & Lovibond, 1996). Anxiety and stress means were slightly above the norm but did not reach the clinical means. This supports previous studies (Al-faris et al., 2012; Inam, 2007) that found that medical students experience high levels of depressive, anxiety, and stress symptoms and are in great need of interventions to improve their psychological well-being.

Table 4
Comparing means of Depression, Anxiety, and Stress (DASS), General Self-Efficacy (GSE), and Satisfaction with Life (SWLS) of the pilot study with scale norms.

<table>
<thead>
<tr>
<th></th>
<th>T1 mean (SD)</th>
<th>T2 mean (SD)</th>
<th>Norm mean (SD)</th>
<th>Clinical mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DASS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>13.05 (8.63)</td>
<td>8.00 (7.03)</td>
<td>6.34 (6.97)*</td>
<td>10.65 (9.3)*</td>
</tr>
<tr>
<td>Anxiety</td>
<td>6.23 (5.82)</td>
<td>5.885 (6.26)</td>
<td>4.7 (4.91)*</td>
<td>10.90 (8.12)*</td>
</tr>
<tr>
<td>Stress</td>
<td>16.00 (9.48)</td>
<td>12.11 (9.36)</td>
<td>10.11 (7.91)*</td>
<td>21.1 (11.15)*</td>
</tr>
<tr>
<td><strong>General Self-Efficacy</strong></td>
<td>29.41 (4.7)</td>
<td>31.41 (4.66)</td>
<td>29.49 (5.13)**</td>
<td>-</td>
</tr>
<tr>
<td><strong>Satisfaction with Life</strong></td>
<td>23.00 (5.74)</td>
<td>25.05 (6.06)</td>
<td>23 (5.75)***</td>
<td>-</td>
</tr>
<tr>
<td><strong>Credibility</strong></td>
<td>20.05 (5.11)</td>
<td>21.05 (5.23)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Expectancy</strong></td>
<td>19.23 (5.37)</td>
<td>17.52 (5.51)</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*(S. Lovibond & Lovibond, 1996)
**(Schwarzer R., 2011)

According to the comparison in Table 4, the GSE mean is within the norm of US adults (Schwarzer R., 2011), whereas the SWLS T1 mean is slightly below the weighted average mean of five independent US samples (Pavot & Diener, 2008). This finding shows that the depression level was clearly above the norm, while anxiety, stress, and life satisfaction were slightly worse than the norm, which might be due to the influence of medical studies. On the other hand, GSE fell within the normal range.

When comparing the pre- and post-study results with other interventional studies, we can see in this study that among the variables assessing the negative spectrum of psychological health, depression was the only domain that showed significant reduction over time, while stress and anxiety did not. Grant (2001) found that the cognitive coaching approach in a sample of university students improved depression and anxiety, but did not improve stress. In contrast, in another study, using life coaching with university students, Grant (2003) found an improvement in depression, anxiety, and stress. This variability of results might be attributed to the coaching approach (self-
development, cognitive, and life coaching), the participants’ disciplines (medical vs. non-medical), or the coach’s characteristics, which has not been discussed by similar studies yet. Nevertheless, in general, the results are supportive of Grant’s findings, which suggest that self-development coaching programs for university students may improve some aspects, especially depression.

Although there was no improvement in stress as a result of the program, stress Cohen’s D showed a small effect size. A review of the data revealed that some individuals had large increases and others had large decreases in stress scores at T2 compared to T1. Interestingly, the increase in stress level was noticed in a similar study after conducting a self-development program (Muenchberger, Kendall, Kennedy, & Charker, 2011). Muenchberger et al. explained that result with Osborne’s shift response (Osborne, Hawkins, & Sprangers, 2006), which indicates a negative outcome (such as increased stress level) after such a program. This is due to the increase in the individual’s awareness, which urges the individual to take action. Osborne considers this a useful phenomenon, as it prompts individuals to change.

The results also showed that the positive spectrum of psychological health (satisfaction with life and self-efficacy) showed significant improvements through the short follow up period. This finding might indicate that self-development programs are more effective at improving the positive aspects than changing the negative aspects in individuals; however, the long-term effect was not assessed, and this improvement cannot be confirmed by the low sample size.

Coaching and coach characteristics were rated by participants on a 0–10 scale for each item. All of the characteristics displayed scores above the mid-point (5), as shown in Table 3. This might indicate that self-development coach characteristics are usually above the normal average rating of the normal population. Moreover, the high internal consistency might also refer to the reliability of these questions to assess the characteristics of the coach and the coaching program.

The Credibility and Expectancy Questionnaire (CEQ) was used to monitor the participants’ overestimation and underestimation pre- and post-program implementation. In other words, overestimation can be found when participants might expect the program to be very effective before attending, and then realize after attending that it is not, and vice versa. Interestingly, the CEQ data collected before and after the intervention showed no significant change. This might indicate that the participants’ cognitive and emotional perceptions about the program were not contributing factors in the changes, but that rather, the program itself resulted in such a change. However, the placebo effect is still a suggested major confounder according to similar studies (Greenwald,
Spangenberg, Pratkanis, & Eskenazi, 1991; Rosa, Rosa, Sarner, & Barrett, 1998), and a control group study design is essential to exclude it.

Although improvements in psychological health were found in this study, the follow up period was not sufficient to draw a strong conclusion, and this pilot study did not have a control group. These changes that took place after a short intervention might be transient, such as in Grant’s RCT after using behavioral coaching (2001). More follow ups are needed to draw a supported conclusion.

5. Conclusion

This pilot study aimed to find preliminary finding support for further investigation regarding the effect of a self-development coaching program on the psychological health of dental and medical students in Saudi Arabia. The results showed a statistically significant improvement in depression, life satisfaction, and general self-efficacy, but not in stress or anxiety. In order to produce a more scientific conclusion, it is recommended that a blind, randomized control trial using a larger sample size should be conducted. In addition, more follow up waves are needed to track the extent of the changes.

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References


Chapter 7. The Pilot Study (Study 4)


Chapter 8. RCT Part I: The Impact of a Self-Development Coaching Programme on Medical and Dental Students’ Psychological Health and Academic Performance: A Randomised Controlled Trial (Study 5)

**Title:** The Impact of a Self-development Coaching Programme on Medical and Dental Students’ Psychological Health and Academic Performance: A Randomised Controlled Trial


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**Date of submission:** 27/8/2014

**Date of acceptance after revision:** 19/8/2015

**Contribution of authors:** The candidate is the primary author of this study, and was responsible for reviewing the literature, designing the study and directing its implementation, data collecting, data analysis, data interpretation, critical discussion of the findings, and writing the manuscript. The second and third authors were the candidate’s supervisory team and they helped in data interpretation, writing, revising and giving feedback on the manuscript.

**Implications to the thesis:**

This study aimed to provide empirical evidence as to the effectiveness of a self-development coaching program for psychological health and academic performance among preclinical medical and dental students in Umm Al-Qura University, Makkah, Saudi Arabia, using a randomised control design, with parallel placebo group. This study gave an answer to the fourth and fifth questions of the thesis to fulfil the thesis’s main objective.
By comparison to the placebo group, in the main study, only short term improvement was found in depression and anxiety; however, no long term improvement was found in the other psychological constructs. Nevertheless, both the placebo and interventional groups showed unexpectedly significant improvement across time. Moreover, no significant difference was found in the academic performance between both groups. The credibility and expectancy assessment indicated that the preconceptions of both programs were alike before the program began. So, this study indicates that such a program might produce an authentic short-term improvement, and a placebo long-term improvement in the students’ psychological health.

**Funding:** Queensland University of Technology PhD fund allocation and Umm Al-Qura University PhD scholarship fund.

**Ethical approval:** Queensland University of Technology (QUT), University Human Research Ethics Committee (UHREC) number 1200000411.

**Conflict of interest:** The primary author has previously provided the program being investigated in the thesis professionally, and has accepted fees for doing so.

**Note:** The paper presented in the following pages is the final version submitted to the journal following the author’s responses to three rounds of comments.
Statement of Contribution of Co-Authors for Thesis by Published Paper

The following is the format for the required declaration provided at the start of any thesis chapter which includes a co-authored publication.

The authors listed below have certified* that:

1. they meet the criteria for authorship in that they have participated in the conception, execution, or interpretation, of at least that part of the publication in their field of expertise;
2. they take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;
3. there are no other authors of the publication according to these criteria;
4. potential conflicts of interest have been disclosed to (a) granting bodies, (b) the editor or publisher of journals or other publications, and (c) the head of the responsible academic unit, and
5. they agree to the use of the publication in the student’s thesis and its publication on the QUT ePrints database consistent with any limitations set by publisher requirements.

In the case of this chapter:

Publication title and date of publication or status: The Impact of a Self-Development Coaching Programme on Medical and Dental Students’ Psychological Health and Academic Performance: A Randomised Controlled Trial (published in 2015)

<table>
<thead>
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<th>Contributor</th>
<th>Statement of contribution*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Khalid Aboalshamat</td>
<td>The candidate is the first author of this paper, and was responsible of reviewing the literature, designing the study and directing its implementation, data collecting, data analysing, data interpretation, critical discussing of the findings, and writing the manuscript.</td>
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<td>20/8/2015</td>
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<tr>
<td>Xiang-Yu Hou</td>
<td>The second author and was one of the candidate’s supervisory team. She provided feedback and valuable input on the initial draft of the manuscript.</td>
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<tr>
<td>Esben Strodi</td>
<td>The third author and was one of the candidate’s supervisory team. He provided feedback and valuable input on the initial draft of the manuscript.</td>
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</table>

Principal Supervisor Confirmation

I have sighted email or other correspondence from all Co-authors confirming their certifying authorship.

Xiang-Yu Hou

Name: Xiang-Yu Hou
Signature: [Signature]
Date: 20/8/2015

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Chapter 8. RCT Part I: The Randomised Controlled Trial (Study 5) 155
The impact of a self-development coaching programme on medical and dental students’ psychological health and academic performance: A randomised controlled trial

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Abstract

Background

The aim of the study was to evaluate the effect of a self-development coaching programme on the psychological health and academic performance of preclinical medical and dental students at Umm Al-Qura University, Saudi Arabia.

Methods

Four-hundred and twenty-two participants (n=422, 20–22 years) fulfilled the study requirements and were invited into a parallel-randomised controlled trial that was partially blinded. Participants were stratified by faculty, gender, and academic year, and then randomised. A total of 156 students participated in the intervention group (IG) and 163 students participated in the control group (CG). The IG received the self-development programme, involving skills and strategies aimed to improve students’ psychological health and academic performance, through a two-day workshop. Meanwhile, the CG attended an active placebo programme focussing on theoretical information that was delivered through a five-hour workshop. Both programmes were conducted by
the same presenter during Week 1 of the second semester of the 2012–2013 academic year. Data were gathered immediately before (T1), one week after (T2) and five weeks (T3) after the intervention. Psychological health was measured using the Depression Anxiety Stress Scale (DASS-21), the General Self-Efficacy (GSE), and the Satisfaction With Life Scale (SWLS). Academic performance was measured using students’ academic weighted grades (WG). Student cognitive and emotional perceptions of the intervention were measured using the Credibility/Expectancy Questionnaire (CEQ).

**Results**

Data from 317 students, who completed the follow ups, were analysed across the three time periods (IG, n=155; CG, n=162). The baseline variables and demographic data of the IG and CG were not significantly different. The IG showed short-term significant reductions in depression and anxiety in compared to CG from T1 to T2. The short-term changes in stress, GSE and SWLS of the IG were not significantly different from those of the CG. While both groups showed a significant change on most of the psychological variables from T1 to T3, no significant differences were found between the groups in this period. In addition, no significant difference was found in WG between the IG and CG after the intervention. No harms relevant to the intervention were reported.

**Conclusion**

The investigated self-development coaching programme showed only a short-term improvement on depression and anxiety compared with an active control. There was no effect of the intervention on academic performance.

**Trial registration**

ACTRN12614000896673

**Funding**

Queensland University of Technology and Umm Al-Qura University.

**Keywords**

Self-development, coaching programme, medical students, dental students, depression, anxiety, stress, self-efficacy, life satisfaction, psychological health, academic performance
Introduction

Psychological health disturbances, including depression, anxiety and stress, are common and well-documented worldwide among dental and medical students [1-7]. Medical and dental students seem to have poorer psychological health than their peers in the general population [1, 8, 9]. The status of these students’ psychological health has also been manifested in terms of low levels of self-efficacy and low levels of satisfaction with life [10, 11]. University students’ poor psychological health is also of significant interest, as it may persist into their professional lives, affect patient safety [12] or lead the students to leave their health profession [13].

Commercial self-development coaching programmes are popular among the general population to enhance people’s psychological health [14]. Self-development coaching programmes are defined as ‘interactive, multidimensional human developmental process, mainly between non-clinical coachees and a trusted coach who has a number of characteristics to facilitate an individual’s life improvement, which could extend sub-sequentially to the organization, in fields valued by the coachees, using a combination of proven and unproven techniques and concepts’ [15]. In fact, self-development coaching programmes are similar to ‘life coaching’, which has a fledgling but growing scientific evidence base [15]. Only a few interventional studies have investigated the effectiveness of self-development programmes on psychological health. A quasi-experimental study involving medical students in Norway exhibited a significant reduction in stress after a 12-week self-development programme [16]. Another study focusing on the general population in Sweden found an improvement in quality of life after a one-week self-development programme [17]. These studies encourage the investigation of the effectiveness of such programmes, especially for medical and dental students, since only a few rigorously evaluated interventions have been conducted on such populations [18].

Given the popularity of self-development coaching programmes and the paucity of research examining the effectiveness of such programmes in improving psychological health, there is a need for further studies to test their effectiveness empirically. A pilot study was previously conducted in Saudi Arabia to investigate the effect of the self-development coaching programme on medical students [19]. The study found that depression, self-efficacy and satisfaction with life improved significantly after attending the programme. However, the pilot study involved a small sample size, only one follow-up wave and no control group.
As such, this study aimed to build upon our previous pilot study to examine the effectiveness of a self-development coaching programme in improving the psychological health and academic performance of preclinical medical and dental students in Saudi Arabia. Specifically, we sought to answer the following two questions: (1) Does the self-development coaching programme have a short and/or longer term effect on the students’ psychological health? (2) Does the programme affect students’ academic performance?

Methods

Study design and participants

This study used a parallel-grouped randomised control trial (RCT) design where the control group received a placebo intervention. Documenting this study was conducted following CONSORT guidelines. The target population was preclinical medical and dental students at Umm Al-Qura University (UQU), Makkah, Saudi Arabia in the 2012–2013 academic year. The students’ age range was 20–22 years. The preclinical medical and dental students study a traditional curriculum (lecture-based) with compulsory course unit structure, and they are assessed by essays, multiple-choice and objective structured clinical examination. The medical/dental programme is composed of one orientation year, two preclinical years (2nd–3rd) and three clinical years (4th–6th), followed by an internship year. Each academic year is composed of two terms with a summer vacation. Eligibility criteria were (a) being a medical or dental student; (b) being a second- or third-year student; and (c) studying at UQU. Exclusion criteria included students who (a) attended the interventional programme during the course of their academic study, (b) under psychological treatments or drugs regimen or (c) did not sign the study consent form.

A sample size of 130 (65 at each group) participants was needed to detect a difference between the two groups. A study power of 90%, type I error of 5%, minimal clinical difference of 4 points in any of the psychological health means, and an average standard deviation of 7, derived from a recent well-designed coaching RCT which used the Depression Anxiety Stress Scale (DASS-21) [20], were used in the sample size calculation. The resulting number (130) for the two groups was multiplied by 1.5 for the design effect (multiple follow-up), yielding a desired sample size of 196 in both groups. This number was again multiplied by 1.5 for the estimated non-response rate (50%) and multiplied by 1.25 for estimated drop-out during the follow-up (20%), with the result that 366 students needed to be approached.
Setting

The study was advertised via large roll-up posters, and students were recruited in the first term via invitation envelopes which contained coloured flyers about the programmes, a study information sheet and the consent form. After receiving participants’ signed consent, participants were randomly allocated into the intervention group (IG) and control group (CG) by the principal investigator. Randomisation was achieved using a computer-generated random number list. The intervention was conducted during the first week of the second term. Students knew their assigned group one week before both programmes were conducted. However, the students and research assistants who managed the study protocol and data collection were blinded to the participants’ group allocation. Thus, the study was partially blinded. Students were assessed three times in the second term, as follows: Week 1 (T1), immediately before the programme was conducted; Week 2 (T2), a week after the programme; and Week 6 (T3), five weeks after the programme concluded. The questionnaires were disseminated and collected between students’ lecture breaks.

Intervention

Students in the IG attended a self-development coaching programme titled “How to Be an Ultra Super Student” (HBUSS), while the control group received a normal lecture-type programme titled “Learning and Success in Health Faculties” (LSHF). Each programme was delivered as a live course in a large lecture theatre during students’ free time in Week 1 of the second term; participants in both groups were supplied with the appropriate programme booklet and audio CD. Due to cultural and religious considerations in Saudi Arabia, male and female seats were separated by a barrier along the theatre, but facing the coach, on the intervention days.

The HBUSS is a self-development coaching programme, which has been developed and run by the lead author, who is a self-development coach and trainer, since 2008 [19]. The contents were derived from the coach’s personal experiences with coaching and from reading and practicing self-development over a number of years. The programme aimed mainly to improve students’ academic performance and psychological health. It did not use psychological therapeutic approaches, but rather focussed on a series of skills and conceptual ideas about studying and coping with challenges during the academic journey.

On the other hand, the LSHF programme was developed by the first author for the purpose of this study only. It provided information about learning in health faculties and the factors leading to success according to a scientific literature review. It also briefly touched on the scientific
research area. The information in the LSHF programme was taken from academic articles or books; however, it did not have a practical aim to improve students’ performance or psychology. Both programs were presented by the first author. The programmes’ modules, CD contents, approach and duration are detailed in Table 1.

Table 1. Comparison between the intervention and control programmes.

<table>
<thead>
<tr>
<th>Intervenional group programme</th>
<th>Control group programme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programme name</td>
<td>‘Learning and Success in Health Faculties’</td>
</tr>
<tr>
<td>Course modules</td>
<td>(1) Bloom’s taxonomy [37]; cognitive, affective and psychomotor learning levels.</td>
</tr>
<tr>
<td>(1) Unleash your inner power: information about self-efficacy and goals in life is discussed.</td>
<td>(2) Scientific literature about variables association with success in health faculties such as the language, income, etc., with no practical points.</td>
</tr>
<tr>
<td>(2) Manage your time effectively: different models and tips to utilize studying time efficiently.</td>
<td>(3) Active learning potential use in health faculties.</td>
</tr>
<tr>
<td>(3) The maximum usefulness of university lectures: different solutions to increase lecture time efficiency.</td>
<td>(4) The importance of scientific research.</td>
</tr>
<tr>
<td>(4) How to study and memorise effectively: skills with exercises to memorise better.</td>
<td></td>
</tr>
<tr>
<td>(5) Dealing with exams: practical tips to deal with exam time.</td>
<td></td>
</tr>
<tr>
<td>(6) Religious teaching: Islamic teaching augments the previous skills and values in the Saudi religious and cultural context.</td>
<td></td>
</tr>
<tr>
<td>Audio CD contents</td>
<td>Twenty-four audio files reiterating the contents of the programme.</td>
</tr>
<tr>
<td>(1) Twenty-four study-motivation audio files.</td>
<td></td>
</tr>
<tr>
<td>(2) Short version of muscle relaxation and positive messages.</td>
<td></td>
</tr>
<tr>
<td>(3) Long version of muscle relaxation and positive messages.</td>
<td></td>
</tr>
<tr>
<td>Approaches to conducting the programme</td>
<td>Normal, standard approach to presenting a lecture at university.</td>
</tr>
<tr>
<td>Motivational vocal tone and body language.</td>
<td>Short questions to be answered individually or in groups.</td>
</tr>
<tr>
<td>Success and Islamic stories (parables).</td>
<td></td>
</tr>
<tr>
<td>Famous people and Islamic quotes (metaphor).</td>
<td></td>
</tr>
<tr>
<td>Recontextualised ideals.</td>
<td></td>
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<tr>
<td>Personification of some values.</td>
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<tr>
<td>Movie clips.</td>
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<tr>
<td>Direct interaction with the audience.</td>
<td></td>
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<tr>
<td>Giving coachees the freedom to choose amongst the programme techniques which</td>
<td></td>
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</tbody>
</table>

Chapter 8. RCT Part I: The Randomised Controlled Trial (Study 5)
While the presenter was careful to follow the intervention and active control group manuals, no independent assessment of treatment fidelity was performed. In addition, while the participants’ attendance was tracked, there was no assessment of completion of quizzes or assignments associated with the workshop material in order to assess the participants’ understanding of the material. This was not done as it is not a common practice for self-development coaching programs, in contrast to other formal training courses, and so would have altered the participants’ experience of a typical self-development coaching program.

**Assessment**

Hard copies of the self-report questionnaire were used. Three aspects were assessed, as follows: (a) psychological health at T1, T2 and T3; (b) participants’ levels of belief in the effectiveness of the programme, considered both logically and emotionally at T1 and T2; and (c) students’ academic performance before and after the intervention.

Psychological health was measured using the DASS-21 [21, 22], General Self-Efficacy scale (GSE) [23], and Satisfaction With Life Scale (SWLS) [24]. The DASS-21 measured negative aspects of students’ psychological health, while GSE and the SWLS measured positive aspects of students’ psychological health. The DASS-21 is composed of 21 questions to assess depression, anxiety and stress subclasses, which are measured by the sum of the 7 corresponding questions. Each question can be answered from 0 “Did not apply to me at all” to 3 “Applied to me very much, or most of the time”. A high DASS-21 subclass score indicates unfavourable status. DASS-21 has excellent psychometric properties, with a Cronbach’s alpha of 0.82 to 0.90 for each subscale [25]. GSE is composed of 10 questions to measure self-efficacy, and each question can be answered from 1 “Not at all true” to 4 “Exactly true”. GSE has a Cronbach’s alpha of .86 among 25 nations [26]. Finally, the SWLS is composed of five questions to measure life satisfaction, and each question can be answered from 7 "Strongly agree" to 1 "strongly disagree". SWLS has a Cronbach’s alpha of .87 [27, 28]. High SWLS or GSE sum-scores indicate high satisfaction or self-efficacy.

<table>
<thead>
<tr>
<th>Duration</th>
<th>Two days (10-hour programme), with multiple 10–40 minute breaks.</th>
</tr>
</thead>
</table>

Note: The information of the intervention group was replicated from the pilot study [19] with slight modification.
In addition, the Credibility and Expectancy Questionnaire (CEQ) [29] was used to investigate participants’ perception levels of the programme’s success, both logically (credibility) and emotionally (expectancy). This is a 6-item scale, with some answers ranging from 1 “Not at all confident” to 9 “Very confident”, and others ranging from 0-100%. The Cronbach’s alpha of the CEQ is .85 [29]. The validated Arabic versions of the DASS-21 and GSE were used [26, 30], while the SWLS and CEQ were face and content validated and translated into Arabic in the pilot study [19] using World Health Organization (WHO) translation guidelines [31].

Academic performance was measured by students’ weighted grades (WG), in the first term before the intervention and at the end of the second term, four months after the intervention. WG were measured according to the following equation:

\[
\text{Weighted grade percentage (WG)} = \sum \left( \frac{\text{each unit's grades} \times \text{unit's credit hours}}{\text{total units credit hours}} \right) \times 10
\]

Student’s grades were obtained from faculties’ administrative offices after receiving the students’ approval. Demographic data included faculty, academic year, gender, family income, marital status and nationality. All identifying information was destroyed after data completion and the data were treated anonymously.

**Incentives and ethical considerations**

Participation in the study was voluntary. All participants received the interventional or placebo programmes without charge. Students received two certificates of appreciation, one upon attending the designated programme, and one after completing all the follow-ups. All attending students were entered in three random prize draws for 50 Saudi Riyal (13.33 U.S dollar) vouchers in each programme.

The study was approved by the Queensland University of Technology ethical committee. As an institutional ethics board had not been formally established at UQU, formal approvals were obtained from the medical and dental faculties at UQU, in addition to the students’ signed consent.

**Randomisation**

Participants were stratified by faculty, gender, and academic year, and then randomised into the IG and CG using computer-generated random number lists by the principal
investigator. Stratified randomisation was conducted mainly to overcome the unbalanced medical/dental student ratio. Neither students nor research assistants were aware of which students were allocated to the IG and CG until the first day of the second term.

Data analysis

SPSS software package version 21 was used to assist in data analysis. Chi-square and Fisher’s exact tests were employed to test the demographic variable differences between the groups. A t-test was used to compare the baselines of the DASS-21 subgroups, GSE, SWLS and CEQ. After splitting data by group, repeated measures analysis of variance (rANOVA) was used to test the difference between T1 to T2, T2 to T3 and T2 to T3 for the IG and CG. Factorial rANOVA was used to analyse the differences in all the outcome variables between IG and CG. Bonferroni correction was used for the rANOVA post hoc test.

Results

The participants’ flow chart is detailed in Figure 1. Among all the students, 422 signed the consent to participate in the study and became eligible to participate, resulting in an initial 64.25% response rate. Of the students, 319 attended the programmes, and only two were lost to follow-ups, resulting ultimately in a 25.88% drop-out rate. Students’ demographic data are displayed in Table 2. Using the Chi-square and Fisher’s exact tests, there was no significant difference in the demographic variables (Table 2).
Figure 1. Flow of participants through the study.
Table 2. Description of the demographic data of the participants from medical and dental students at preclinical years at UQU

<table>
<thead>
<tr>
<th></th>
<th>Interventional group</th>
<th>Control group</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. (%)</td>
<td>No. (%)</td>
<td>No. (%)</td>
</tr>
<tr>
<td></td>
<td>n=155</td>
<td>n=162</td>
<td>n=317</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>68 (43.9)</td>
<td>76 (46.9)</td>
<td>144 (45.4)</td>
</tr>
<tr>
<td>Female</td>
<td>87 (56.1)</td>
<td>86 (53.1)</td>
<td>173 (54.6)</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>153 (98.7)</td>
<td>157 (96.9)</td>
<td>310 (97.8)</td>
</tr>
<tr>
<td>Married</td>
<td>2 (1.3)</td>
<td>5 (3.1)</td>
<td>7 (2.2)</td>
</tr>
<tr>
<td><strong>Family income</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low*</td>
<td>46 (29.7)</td>
<td>61 (37.7)</td>
<td>107 (33.8)</td>
</tr>
<tr>
<td>High**</td>
<td>109 (70.3)</td>
<td>101 (62.3)</td>
<td>210 (66.2)</td>
</tr>
<tr>
<td><strong>Nationality</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saudi</td>
<td>151 (97.4)</td>
<td>160 (98.8)</td>
<td>311 (98.1)</td>
</tr>
<tr>
<td>Non-Saudi</td>
<td>4 (2.6)</td>
<td>2 (1.2)</td>
<td>6 (1.9)</td>
</tr>
<tr>
<td><strong>Academic year</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd year</td>
<td>75 (48.4)</td>
<td>79 (48.8)</td>
<td>154 (48.6)</td>
</tr>
<tr>
<td>3rd year</td>
<td>80 (51.6)</td>
<td>83 (51.2)</td>
<td>163 (51.4)</td>
</tr>
<tr>
<td><strong>Faculty</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medicine</td>
<td>126 (81.3)</td>
<td>133 (82.1)</td>
<td>259 (81.7)</td>
</tr>
<tr>
<td>Dentistry</td>
<td>29 (18.7)</td>
<td>29 (17.9)</td>
<td>58 (18.3)</td>
</tr>
</tbody>
</table>

*Low family income: less than 10,000 Saudi Riyal/ month (2,666.67 U.S dollar).
*High family income: more than 10,000 Saudi Riyal/ month (2,666.67 U.S dollar).

Note: Using Chi-square and Fisher’s exact test for cells count less than 5, there was no significant difference in the demographic variables between the two groups.

Table 3 shows the means and standard deviations for all measured variables for IG and CG. Using t-test, the psychological variables, CEQ and WG’s baseline measures were not significantly different between the IG and CG (Table 3).
Table 3. The mean scores for depression, anxiety, stress, GSE, the SWLS, credibility, expectancy and WG at T1, T2, T3 for the IG and CG, and the results of the rANOVA after data were split by group.

<table>
<thead>
<tr>
<th></th>
<th>T1 M (SD)</th>
<th>T2 M (SD)</th>
<th>T3 M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Depression</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IG</td>
<td>12.79 (9.42)ab</td>
<td>7.08 (7.04)c</td>
<td>9.28 (8.6)</td>
</tr>
<tr>
<td>CG</td>
<td>12.32 (9.31)ab</td>
<td>8.76 (7.76)</td>
<td>8.88 (8.27)</td>
</tr>
<tr>
<td><strong>Anxiety</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IG</td>
<td>11.36 (9.15)ab</td>
<td>5.99 (6.20)c</td>
<td>7.46 (8.1)</td>
</tr>
<tr>
<td>CG</td>
<td>9.97 (8.48)ab</td>
<td>6.79 (6.88)</td>
<td>7.31 (6.95)</td>
</tr>
<tr>
<td><strong>Stress</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IG</td>
<td>16.81 (9.94)ab</td>
<td>11.03 (7.43)</td>
<td>11.24 (8.56)</td>
</tr>
<tr>
<td>CG</td>
<td>16.06 (9.02)ab</td>
<td>11.57 (8.71)</td>
<td>12.12 (8.66)</td>
</tr>
<tr>
<td><strong>GSE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IG</td>
<td>27.45 (4.71)ab</td>
<td>28.49 (5.25)</td>
<td>28.48 (5.69)</td>
</tr>
<tr>
<td>CG</td>
<td>27.17 (4.20)ab</td>
<td>27.70 (4.38)</td>
<td>27.50 (5.04)</td>
</tr>
<tr>
<td><strong>SWLS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IG</td>
<td>24.13 (6.61)ab</td>
<td>25.81 (6.43)</td>
<td>25.42 (6.31)</td>
</tr>
<tr>
<td>CG</td>
<td>24.31 (6.11)a</td>
<td>25.35 (6.38)</td>
<td>24.67 (6.63)</td>
</tr>
<tr>
<td><strong>Credibility</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IG</td>
<td>23.29 (5.91)a</td>
<td>26.06 (6.03)</td>
<td>-</td>
</tr>
<tr>
<td>CG</td>
<td>23.00 (5.08)a</td>
<td>21.02 (7.00)</td>
<td>-</td>
</tr>
<tr>
<td><strong>Expectancy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IG</td>
<td>23.46 (6.34)a</td>
<td>24.63 (6.61)</td>
<td>-</td>
</tr>
<tr>
<td>CG</td>
<td>22.28 (5.76)a</td>
<td>19.52 (7.85)</td>
<td>-</td>
</tr>
<tr>
<td><strong>WG</strong>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IG</td>
<td>81.1 (8.42)a</td>
<td>83.55 (7.22)</td>
<td>-</td>
</tr>
<tr>
<td>CG</td>
<td>80.26 (10.31)a</td>
<td>82.56 (6.91)</td>
<td>-</td>
</tr>
</tbody>
</table>

Abbreviation: IG, interventional group; CG, control group; T1, before the intervention at week 1; T2, one week after the intervention at week 2; T3, five weeks after the intervention at week 6; M, mean; SD, standard deviation; GSE, General Self-Efficacy; SWLS, Satisfaction With Life Scale.

* p-value<.05 for rANOVA post hoc test for T1-T2.

b p-value<.05 for rANOVA post hoc test for T1-T3.

c p-value<.05 for rANOVA post hoc test for T2-T3.

WG in column T1 = students’ weighted grades before the intervention, and in column T2, after the intervention, for simplicity in data presentation.

All the variables had acceptable levels of skewness (-1.55 to 1.38), and kurtosis ranged from (-.3 to 1.88), except for WG after the intervention with kurtosis of 3.74. Thus, parametric tests were used, even for WG because the chosen tests are robust. Sensitivity analysis using non-parametric tests (Mann-Whitney U, Friedman, and Wilcoxon tests) showed the same reported significance for the parametric tests. The Cronbach’s alpha for the measures of depression, anxiety, stress, GSE, and SWLS were .86, .83, .84, .84, and .82, respectively.
The results of rANOVA after splitting the data to analyse IG and CG across time (T1-T2, T1-T3, and T2-T3) were included in Table 3. Factorial rANOVA results were detailed in Table 4. Table 4 also shows the results of the post hoc test to compare between the interaction of the groups and different time points. Depression, anxiety, stress, SWLS, GSE for IG and CG measures across time are illustrated in Figures 2 to 6.

Table 4. Factorial rANOVA and post hoc test results for the interaction of groups and depression, anxiety, stress, GSE, the SWLS, credibility, and expectancy.

<table>
<thead>
<tr>
<th></th>
<th>within subject effect</th>
<th>Between subject effect</th>
<th>Post hoc test Time *group</th>
<th>df(F), p</th>
<th>df(F), p</th>
<th>df(F), p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>1.91(4.22), p=.017</td>
<td>1.91(4.22), p=.017</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1-T2 *group</td>
<td></td>
<td></td>
<td></td>
<td>1(6.33), p=.012</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T2-T3 *group</td>
<td></td>
<td></td>
<td></td>
<td>1(7.64), p=.006</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1-T3 *group</td>
<td></td>
<td></td>
<td></td>
<td>1(0.01), p=.934</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>1.83(66.14), p&lt;.001</td>
<td>1.83(4.03), p=.021</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>T1-T2 *group</td>
<td></td>
<td></td>
<td></td>
<td>1(7.96), p=.005</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T2-T3 *group</td>
<td></td>
<td></td>
<td></td>
<td>1(2.08), p=.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1-T3 *group</td>
<td></td>
<td></td>
<td></td>
<td>1(2.03), p=.156</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stress</td>
<td>1.91(78.59), p&lt;.001</td>
<td>1.91(1.77), p=.172</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>T1-T2 *group</td>
<td></td>
<td></td>
<td></td>
<td>1(2), p=.158</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T2-T3 *group</td>
<td></td>
<td></td>
<td></td>
<td>1(0.18), p=.676</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1-T3 *group</td>
<td></td>
<td></td>
<td></td>
<td>1(2.68), p=.103</td>
<td></td>
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</tr>
<tr>
<td>GSE</td>
<td>1.93(7.23), p=.001</td>
<td>1.93(1.02), p=.358</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>T1-T2 *group</td>
<td></td>
<td></td>
<td></td>
<td>1(1.4), p=.238</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T2-T3 *group</td>
<td></td>
<td></td>
<td></td>
<td>1(0.06), p=.805</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1-T3 *group</td>
<td></td>
<td></td>
<td></td>
<td>1(1.52), p=.218</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SWLS</td>
<td>1.91(16.3), p&lt;.001</td>
<td>1.91(1.99), p=.14</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>T1-T2 *group</td>
<td></td>
<td></td>
<td></td>
<td>1(1.97), p=.161</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T2-T3 *group</td>
<td></td>
<td></td>
<td></td>
<td>1(0.44), p=.51</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1-T3 *group</td>
<td></td>
<td></td>
<td></td>
<td>1(3.14), p=.077</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Credibility</td>
<td>1(1.23), p=.269</td>
<td>1(45.17), p&lt;.001</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1-T2 *group</td>
<td></td>
<td></td>
<td></td>
<td>1(45.17), p&lt;.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expectancy</td>
<td>1(4.68), p=.031</td>
<td>1(28.14), p&lt;.001</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>T1-T2 *group</td>
<td></td>
<td></td>
<td></td>
<td>1(28.14), p&lt;.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WG</td>
<td>1(86.06), p&lt;.001</td>
<td>1(1.55), p=.214</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1-T2 *group</td>
<td></td>
<td></td>
<td></td>
<td>1(1.55), p=.214</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Abbreviation: T1, before the intervention at week 1; T2, one week after the intervention at week-2; T3, five weeks after the intervention at week 6; M, mean; SD, standard deviation; df, degrees of freedom; p, p-value; GSE, General Self-Efficacy; SWLS, Satisfaction With Life Scale.

* For WG row, T1 = students’ weighted grades before the intervention, and in column T2, after the intervention, for simplicity in data presentation.
Figure 2. Depression for groups across time.

Figure 3. Anxiety for groups across time.

Figure 4. Stress for groups across time.
In general, Table 4 indicates that the within-subject effect of time was significant for depression, anxiety, stress, GSE, SWLS, expectancy, WG, but not credibility. Moreover, the interactions between time and group were only significant in terms of depression, anxiety, credibility, and expectancy. According to Table 3, depression, anxiety and stress in IG and CG improved (decreased) significantly from T1 to T2 (one week period). However, the post hoc test in Table 4 indicates that the improvement from T1 to T2 was significantly more in IG than CG. Table 3 shows that depression, anxiety and stress were significantly higher at T3 in compared to T1 (five weeks apart) in both groups, but Table 4 indicates that the improvement from T1 to T3 was not significantly different between IG and CG.
Also, Table 3 shows that GSE level in IG improved (increased) significantly from T1 to T2 (one week period), while SWLS improved in both groups significantly in the same period. However, the post hoc test in Table 4 indicates that the improvement within GSE and SWLS from T1 to T2 was not significantly different between IG and CG. Table 3 also shows that GSE and SWLS were significantly higher in T3 in compared to T1 (five weeks apart) in IG only, but Table 4 indicates that the improvement from T1 to T3 was also not significantly different between IG and CG.

Tables 3 and 4 shows that both credibility and expectancy increased significantly in the IG, whereas they decreased significantly in the CG after the intervention. Finally, the results in Tables 3 and 4 show that WG improved after the programmes in both the IG and CG. However, this improvement was not significantly different between IG and CG. Among all of the psychological and performance outcome variables, no harm was detected or reported.

**Discussion**

This study aimed to explore the impact of a self-development coaching program, in comparison with an active control, upon the psychological health and academic performance of medical and dental students in Saudi Arabia. The results of the study indicate that the intervention had only a significant short-term (one week) effect on depression and anxiety on the students compared with the control group. However the intervention appeared to have no long-term (5 weeks) effect on the students’ psychological health or academic performance compared to those in the CG.

**The short term effect of the program**

In terms of the short-term effect of the intervention on the students’ psychological health, depression, anxiety and stress means were reduced significantly in both groups. However, IG exhibited a greater reduction in depression and anxiety only after one week. This improvement in depression, anxiety and stress were considerable, given that the reported means reduced at T1 from means classified as mild and moderate into normal means according to the DASS-21 scoring guide [21, 22]. In addition, GSE was increased significantly in IG compared with the active control group, while SWLS was increased significantly in both groups. However, the short term improvement was not significantly different between IG and CG in GSE or SWLS.
The long term effect of the program

Although the intervention group displayed a greater reduction in depression and anxiety compared with the active control group from T1 to T2, this was not maintained from T1 to T3. This appeared to be due to a significant increase in the levels of depression and anxiety from T2 to T3 in the intervention group.

This indicates that the long term improvement of depression and anxiety may not be maintained in IG. However a longer time frame is required to have greater confidence with such a conclusion. Both general self-efficacy and satisfaction with life appeared to improve with the intervention and this was maintained from T2 to T3, while weighted grades improved from T1 to T2. However there were no significant differences between the intervention and active control group indicating that both interventions may have had an impact on these variables.

Credibility and expectancy were similar in the IG and CG at the baseline, indicating that participants did not have prior cognitive or emotional biased perceptions of the HBUSS programme. Nevertheless, IG participants showed an increase in credibility and expectancy levels, while those of the CG had decreased. This indicated that students were able to identify the beneficial programme.

The observed effects are notable given that medical students are more likely to be distressed in the middle of the academic term, when exams take place and more assignments are due, compared to the beginning of the term [32]. The results support the view that such interventions can be useful if conducted towards the middle or the end of the academic year, when students’ psychological health is more likely to deteriorate [32, 33].

It is also interesting to note that even the students in the CG had a favourable psychological improvement during the follow-ups compared to the baseline. This suggests that either a placebo effect was present with the active control group, or else some aspect of the active control group had an impact upon the participants. This point should be addressed in further studies’ by adding a waitlist control group.

Our results compared to the literature

When Holm et al. investigated the effect of a self-development intervention on third-year medical students in Norway, they found a significant improvement in students’ stress and psychological health three months after the intervention [16]. This contradicted our findings in
terms of both an effect upon stress, as well as maintenance of improvements of depression or anxiety in the intervention group. This can be explained by several factors, including the length of Holm et al.’s intervention, which was three months (1.5 hours/week) in contrast to our compact two-day programme, which may suggest that programs delivered in shorter segments over longer periods may be more helpful for students than programs that deliver a large amount of content over a relatively short period. In addition, the different content of both programmes may be a contributing factor. Another possible explanation is that in Holm et al.’s study, students were able to choose to participate in the self-development group, increasing the chance of selection bias, while students in our study were allocated randomly. Furthermore, the programme in Holm et al.’s study was conducted by a psychotherapist, while that in our study was not. Finally, different scales were used, which might have resulted in this difference.

Fernros et al.’s study also showed a significant improvement in health-related quality of life over a 6 month period, following a one-week self-development programme, compared with a control group, in a sample from the general population [17]. Fernros et al.’s intervention was provided by a self-development coach and trainer who had been conducting this programme for many years, which is similar to our intervention. However the differences in findings might again be attributed to a number of factors. First, once again there were differences in dosage, with the Fernros et al. intervention involving 14 hours of contact a day over a one-week period. Other explanations include the different contents of Fernros et al.’s intervention and the likelihood of selection bias, as all the participants were self-selected. Finally, it is more likely that participants who paid for the programme (3,055 euro) would perceive an improvement, as the cost might influence a placebo effect [34].

Two interventional studies that used life coaching as an intervention for university students [35, 36] also reported a significant reduction in depression, anxiety and stress after short-term follow-up using the DASS-21. Also similar to our study, the authors did not find an effect on students’ academic performance [35]. These findings are in line with our results, with the exception that our study did not find a difference between the intervention and control groups on change in stress. These studies by Grant et al., did involve small sample sizes (<25) so it is possible that interventions presented in smaller groups than those used in our study may have a bigger impact upon the reduction of stress in university students. Another explanation is that life coaching in these studies was conducted by professional psychologists who depended mainly on facilitation processes to help the coachees to achieve pre-settled goals. This different approach might be more effective.
on stress than our intervention. Nevertheless, this similarity indicates that life coaching might have comparable effects on self-development coaching programmes.

**Strengths and limitations**

This study had several strengths, including the partially blinded RCT design, the placebo intervention (the first according to our knowledge among coaching interventions), the validated instruments used, the large sample size and the relatively low percentage of drop-out in such a study design. In fact, this study is considered the first intervention in the Middle East and the Arab world attempting to improve psychological health. However, a number of limitations should be acknowledged. The first author was the coach for the intervention and responsible for the randomisation. The LSHF programme duration (one-day) was not matched with the HBUSS programme (two-days). However, this was an attempted to reduce the anticipated students’ drop-out rate in CG in a second day. Also, there was a level of complexity in attributing causes and effects; for example, it is hard to identify the influential part among the program’s module or CD contents. Nevertheless, self-development programmes are usually given as one package of multiple modules to help the coachees with different issues.

Furthermore, the difference in original admission numbers between medical and dental faculties led to an unbalanced medical to dental students’ ratio. In addition, the study’s results cannot be generalised to all self-development coaching programmes, as they differ according to contents and presenters; neither can they be generalised to medical and dental students throughout Saudi Arabia. More importantly, longer follow-up periods and a waitlist control group were needed, and a better understanding of outcomes. Such points should be considered in future studies’ protocols.

**Conclusion**

The self-development coaching programme ‘How to Be an Ultra Super Student’ seems to be a promising way to improve medical and dental students’ psychological health. The programme had only a short-term effect on some of the negative aspects of psychological health. However, no effect was shown on positive aspects or the students’ academic performance. The effect of the programme seems to be limited at the moment; however, given the importance of finding successful interventions for improving psychological health and academic performance in university students in Arab countries, further research building upon this study is recommended. Such research should explore the impact of changing aspects of the current intervention (such as the content, duration or
delivery format) upon the improvement of medical and dental students’ psychological health and academic performance.

**Trial Registration and protocol**

The full protocol of the study can be retrieved by contacting the authors. The trial registration number is ACTRN12614000896673 at the Australian New Zealand Clinical Trials Registry.

**Abbreviations**

CEQ: Credibility/Expectancy Questionnaire  
DASS-21: Depression Anxiety Stress Scale  
GSE: General Self-Efficacy scale  
HBUSS: How to Be an Ultra Super Student  
IG: interventional group  
LSHF: Learning and Success in Health Faculties  
rANOVA: repeated measures analysis of variance  
RCT: randomised control trial  
SG: study group  
SWLS: Satisfaction With Life Scale  
T1: immediately before the programme conduction  
T2: a week after programme conduction  
T3: five weeks after the programme conduction  
U.S: United States of America  
UQU: Umm Al-Qura University  
WG: students’ academic weighted grades

**Competing Interests**

The authors declare that the intervention programme HBUSS used in the presented study, was based on previously conducted paid HBUSS self-development programme presented by the first author.
Authors’ contributions

KA, XH and ES conceived of the study and participated in the study design and protocol. KA was responsible for the randomisation, intervention protocol, data acquisition, analysis, interpretation and wrote the draft manuscript. XH and ES helped with the data interpretation, as well as revising/writing the study manuscript. All authors read and approved the manuscript.

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References


Chapter 9. RCT Part II: Assessment of the Coaching Program and Coach Characteristics

Objective: This chapter aims to evaluate the coaching program and coach characteristics (CPCC) among the interventional and control group, to reduce the CPCC variables and to assess the psychometric properties of CPCC.

Methods: The data of the eleven CPCC variables from 317 participants were analysed using Mann–Whitney U to test the significance between the two groups. Explanatory Factor Analysis was used to reduce the number of variables, while the Cronbach's alpha was used to assess the psychometric properties.

Results: There was no significant difference in CPCC among both groups. CPCC variables were reduced into two subclasses: the coaching program characteristics subclass (three questions), and the coach characteristics subclass (eight questions). CPCC as a whole has high internal consistency (.94). The subclasses also have high internal consistencies: .91 and .93 respectively.

Conclusion: The results might indicate that the characteristics of the programs and the coach are not different from those of the control group. CPCC has good psychometric properties, but needs further validation in future research.

Introduction

Despite the importance of the characteristics of the coaching program and the coach, which were indicated in Study 1, Chapter 2, they received little attention from scholars. However, Study 1 indicated that these characteristics do affect the self-development program outcomes. In the pilot study (Study 4, Chapter 7), eleven questions to measure the coaching program and coach characteristics (CPCC), which were derived from literature, were measured after conducting the self-development coaching program, “How to be an Ultra Super Student”. The results indicated that the means of all questions were above the mid-point (> 5). The CPCC had a Cronbach’s alpha of
.93, indicating a high internal consistency. Nevertheless, similar data and analysis for CPCC were not presented in the main randomised controlled trial (RCT) at Study 5, Chapter 8.

This additional chapter presents supplemental data and analysis of the CPCC that were measured as a part of the RCT study. These data were not presented in the published RCT due to limited space. The main aim of the chapter is to detect if the CPCC data measured in the RCT study were different between the interventional program (IG) and the control program (CG). The secondary aims for this chapter are to reduce the variables into fewer factors for better analysis, in addition to evaluating the psychometric properties of the CPCC.

Methods

The data used in this chapter were collected from the 317 participants who participated in the RCT study (Study 5, Chapter 8). Study design, participants, setting, intervention, randomisation, incentive and ethical consideration were the same as for the RCT study. However, the participants in the IG and CG were actually asked to answer the 11 questions investigating the Coaching Program and Coach Characteristics (CPCC) one week after the intervention. The CPCC questions were illustrated in Chapter 4. The questions are detailed in Table 9.1 (see the complete questionnaire in Appendices I and J).

Table 9.1.

<table>
<thead>
<tr>
<th>Question number</th>
<th>Question statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>How do you evaluate your satisfaction with the course?</td>
</tr>
<tr>
<td>2</td>
<td>How much do you think the course is related to your life?</td>
</tr>
<tr>
<td>3</td>
<td>How much do you think the trainer attracted your attention during the program?</td>
</tr>
<tr>
<td>4</td>
<td>How do you evaluate the trainer’s confidence?</td>
</tr>
<tr>
<td>5</td>
<td>How much do you think that the trainer was a real mentor for applying the course material?</td>
</tr>
<tr>
<td>6</td>
<td>How much do you think you have applied what you have learned in the course?</td>
</tr>
<tr>
<td>7</td>
<td>How do you evaluate the trainer’s ability to persuade?</td>
</tr>
<tr>
<td>8</td>
<td>How do you evaluate the trainer’s ability to motivate?</td>
</tr>
<tr>
<td>9</td>
<td>How do you evaluate the trainer’s ability to influence your emotions?</td>
</tr>
<tr>
<td>10</td>
<td>How do you rate the trainer’s empathy for the audience (by having the same experience)?</td>
</tr>
<tr>
<td>11</td>
<td>How much do you think the trainer used his/her personal experience?</td>
</tr>
</tbody>
</table>
Note. The questions will be used subsequently according to the same numbers found in this table, for the tables following.

For the statistical analysis, SPSS software package version 21 (IBM Corp., Armonk, NY, USA) was used. Several analyses were undertaken including: a missing data analysis, descriptive statistics, factors reduction, normality testing, the significance difference between two groups, and an internal consistency test. Little’s MCAR test was used to detect the type of missing data which needed to be dealt with. Descriptive statistics were produced. Before comparing CPCC between IG and CG, explanatory factor analysis (EFA) was used to reduce the variables. Maximum Likelihood and direct Oblimin (oblique) rotation were used. The Shapiro-Wilk test was used to test normality of the variables (Razali & Wah, 2011). Subsequently, the Mann–Whitney U test was used to compare each variable of CPCC and the sum of questions of each extracted factor between IG and CG. Cronbach’s alpha was calculated to evaluate the internal consistency with a \( p \)-value < .05 being used as the level of significance.

Results

The missing data analysis indicated very few missing values ranged between 0.3–0.6% in some variables. Little’s MCAR test had \( p = .719 \); that is, missing values were missing completely at random. So, missing data were replaced by the expectation maximization (EM) method (Allison, 2002, p. 27).

Upon factor reduction, EFA analysis results indicated two latent factors that had eigenvalues above one (Table 9.2). These two factors accounted for 67% of the total variance.

Table 9.2.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Eigenvalues</th>
<th>% of Variance</th>
<th>Cumulative %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7.004</td>
<td>63.670</td>
<td>63.670</td>
</tr>
<tr>
<td>2</td>
<td>1.009</td>
<td>9.171</td>
<td>72.840</td>
</tr>
</tbody>
</table>

The resulting pattern matrix is illustrated in Table 9.3. The variables communalities indicated that the extracted factors accounted for 43% to 90% of the item’s variance, thus none of the variables were removed. As can be seen, Questions 1, 2 and 6 load to Factor 1, which clearly
can be identified as the coaching program characteristics subclass. Questions 3, 4, 5, 7, 8, 9, 10 and 11 load to (Factor 2) which gives an indication of the coach characteristics subclass.

Table 9.3.

* Higher than 0.4.

The coaching program characteristics subclass was calculated by the sum of the corresponding questions (1, 2 and 6) with values ranged from 3 to 30. The coach characteristics subclass was calculated by the sum of the corresponding questions with values ranged from 8 to 80. Descriptive statistics of all variables and the subclasses are presented in Table 9.4.
Table 9.4.

Descriptive of CPCC

<table>
<thead>
<tr>
<th>Question No.</th>
<th>Total M</th>
<th>Total SD</th>
<th>Total Med</th>
<th>Total Min</th>
<th>Total Max</th>
<th>IG M</th>
<th>IG SD</th>
<th>IG Med</th>
<th>IG Min</th>
<th>IG Max</th>
<th>CG M</th>
<th>CG SD</th>
<th>CG Med</th>
<th>CG Min</th>
<th>CG Max</th>
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<td>7.20</td>
<td>2.47</td>
<td>8.00</td>
<td>1</td>
<td>10</td>
<td>7.48</td>
<td>2.39</td>
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</tr>
<tr>
<td>2</td>
<td>7.14</td>
<td>2.53</td>
<td>8.00</td>
<td>1</td>
<td>10</td>
<td>7.01</td>
<td>2.58</td>
<td>7.00</td>
<td>1</td>
<td>10</td>
<td>7.26</td>
<td>2.47</td>
<td>8.00</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>8.69</td>
<td>1.89</td>
<td>10.00</td>
<td>1</td>
<td>10</td>
<td>8.74</td>
<td>1.79</td>
<td>10.00</td>
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<td>10</td>
<td>8.66</td>
<td>1.98</td>
<td>9.50</td>
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<td>10.00</td>
<td>1</td>
<td>10</td>
<td>9.54</td>
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<td>9.55</td>
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<td>1.84</td>
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<td>9.00</td>
<td>1</td>
<td>10</td>
<td>8.26</td>
<td>1.88</td>
<td>9.00</td>
<td>2</td>
<td>10</td>
<td>8.21</td>
<td>2.11</td>
<td>9.00</td>
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<td>10</td>
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<td>8</td>
<td>8.52</td>
<td>2.07</td>
<td>9.00</td>
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<td>10</td>
<td>8.39</td>
<td>2.12</td>
<td>9.00</td>
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<td>8.09</td>
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<td>9.00</td>
<td>1</td>
<td>10</td>
<td>7.93</td>
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<td>1</td>
<td>10</td>
<td>8.72</td>
<td>1.70</td>
<td>9.00</td>
<td>1</td>
<td>10</td>
<td>8.56</td>
<td>1.93</td>
<td>9.00</td>
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<td>10</td>
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<tr>
<td>11</td>
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<td>1.74</td>
<td>9.00</td>
<td>1</td>
<td>10</td>
<td>8.77</td>
<td>1.58</td>
<td>9.00</td>
<td>1</td>
<td>10</td>
<td>8.64</td>
<td>1.88</td>
<td>9.00</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Factor 1</td>
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<td>6.88</td>
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<td>30</td>
<td>21.49</td>
<td>6.74</td>
<td>23.00</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>Factor 2</td>
<td>68.38</td>
<td>12.09</td>
<td>72.00</td>
<td>12</td>
<td>80</td>
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<td>80</td>
<td>68.27</td>
<td>12.80</td>
<td>73.00</td>
<td>12</td>
<td>80</td>
</tr>
</tbody>
</table>

*M; Mean, SD: Standard Deviation, Min: Minimum, Max; Maximum, IG: interventional group, CG; control group, SD: standard deviation, Factor 1: coaching program characteristics, Factor 2: coach characteristics*
All the variables had Shapiro-Wilk p-level < .001, so they were not normally distributed. Thus, Mann–Whitney U tests were used to compare between IG and CG. Mann–Whitney U tests results (Table 9.5) indicated that the difference between IG and CG in all the variables, in addition to Factor 1 and Factor 2, were insignificant.

Table 9.5.
*Mann-Whitney U test comparing the CPCC variables between IG and CG*

<table>
<thead>
<tr>
<th>Question No.</th>
<th>Mann-Whitney U</th>
<th>Z</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11674.5</td>
<td>-1.093</td>
<td>0.274</td>
</tr>
<tr>
<td>2</td>
<td>11956.5</td>
<td>-0.742</td>
<td>0.458</td>
</tr>
<tr>
<td>3</td>
<td>12424.5</td>
<td>-0.172</td>
<td>0.863</td>
</tr>
<tr>
<td>4</td>
<td>12032</td>
<td>-0.839</td>
<td>0.402</td>
</tr>
<tr>
<td>5</td>
<td>11871</td>
<td>-0.856</td>
<td>0.392</td>
</tr>
<tr>
<td>6</td>
<td>12262.5</td>
<td>-0.362</td>
<td>0.717</td>
</tr>
<tr>
<td>7</td>
<td>12194</td>
<td>-0.455</td>
<td>0.649</td>
</tr>
<tr>
<td>8</td>
<td>11421</td>
<td>-1.478</td>
<td>0.139</td>
</tr>
<tr>
<td>9</td>
<td>12227</td>
<td>-0.412</td>
<td>0.68</td>
</tr>
<tr>
<td>10</td>
<td>12350.5</td>
<td>-0.265</td>
<td>0.791</td>
</tr>
<tr>
<td>11</td>
<td>12528</td>
<td>-0.035</td>
<td>0.972</td>
</tr>
</tbody>
</table>

Factor 1: coaching program characteristics, Factor 2: coach characteristics

To test the internal consistency of CPCC, an inter-correlation matrix was generated (Table 9.6). The Cronbach's alpha for the CPCC variable as a whole was $r = 0.94$. The Cronbach's alphas for Factor 1 and Factor 2 were $r = 0.91$ and 0.93 respectively.

Table 9.6.
*Inter-correlation matrix of CPCC questions*

<table>
<thead>
<tr>
<th>Question No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0.82</td>
<td>1</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3</td>
<td>0.69</td>
<td>0.6</td>
<td>1</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0.33</td>
<td>0.36</td>
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<td>1</td>
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<td></td>
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</tr>
<tr>
<td>5</td>
<td>0.64</td>
<td>0.62</td>
<td>0.67</td>
<td>0.49</td>
<td>1</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>0.78</td>
<td>0.72</td>
<td>0.62</td>
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<tr>
<td>8</td>
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<tr>
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<td>0.49</td>
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<td>0.47</td>
<td>0.56</td>
<td>0.5</td>
<td>0.54</td>
<td>0.55</td>
<td>0.67</td>
<td>1</td>
</tr>
</tbody>
</table>
Discussion

The main aim of this chapter was to assess if CPCC variables were different between IG and CG. The results of the testing indicate that there is no significant difference between any characteristics in any generated subclass. This result might indicate that self-development coaching program characteristics and coach characteristics are no different from normal lecture characteristics (the placebo program). It is suggested that the coach presented the placebo program in a self-development coaching program style.

Explanatory factor analysis indicated that Questions 1, 2 and 6 can be grouped to Factor 1, which is the program characteristics subclass, while Questions 3, 4, 5, 7, 8, 9, 10 and 11 can be grouped to Factor 2 which is the coach characteristics subclass. Thus, program characteristics and coach characteristics were measured by the sums of their corresponding questions.

In regards to the psychometric properties of CPCC, the overall Cronbach’s alpha ($r = 0.94$) is similar to the pilot study (Study 4, Chapter 8). The Cronbach’s alpha for each of the subscales was also good. This indicates that this set of questions can be used in future studies to measure the coaching program and coach characteristics. However, further content validity and confirmatory factor analysis is needed to validate the questions. One of the limitations of this research is that CPCC questions were self-reported by the participants after one week of conducting both programs, which indicates potential recall bias.

Conclusion

Analysing the coaching programs and coach characteristics indicated that they were not different between the interventional and control groups. This might have important implications for the results of Study 5, Chapter 8. EFA indicated that the variables load into two main subclasses: the program’s characteristics subscale (three questions) and the coach characteristics subscale (eight questions). The Cronbach’s alphas for the overall CPCC variable and the subclasses were very high, indicating a high internal consistency. However, CPCC needs further validation to be viable for use as a validated scale.
Chapter 10. General Discussion

Introduction

The previous chapters (4 to 8) presented a separate discussion for each study. They discussed the results of the various studies in relation to similar literature, strengths, limitations and implications. This chapter provides a general discussion to consolidate the articles presented in this thesis. More importantly, this chapter analyses how the studies in this thesis answer the research questions posed in this thesis. This chapter also discusses some methodological aspects of the articles presented, including participants, dropout rates and missing values. It discusses the strengths and limitations of the study, with corresponding recommendations for future studies. Finally, the chapter provides a conclusion to the thesis as a whole.

Studies Consolidation

The results of the studies presented in this thesis give more data to enhance understanding of the psychological health and academic performance among preclinical medical and dental students in Saudi Arabia using a sample from Umm Al-Qura University (UQU) students in the Holy City of Makkah. More importantly, the results give evaluations of the changes in psychological and academic performance after the students attended a self-development coaching program as an intervention aimed at improving their psychological health. The results of the thesis also give important data on the impact of self-development coaching programs on a population.

The studies presented in this thesis are linked to fulfil the aims of the thesis. On one side, the cross sectional study (Study 2), Chapter 5, evaluated the target population’s psychological health, illustrating a high level of psychological burden among the students. This finding justified the impetus to provide an intervention to improve the students’ psychological health. The longitudinal study (Study 3) was essential to observe students’ psychological health across time to provide a contextual understanding of the usual psychological trajectory within an academic year among the target population, as this was not clear in the literature. This was important for the results not to be misinterpreted by the time factor for pre- and post-interventional measurements. For example,
Study 3 indicated that the psychological health constructs were poorer in the middle of an academic term than at the beginning of the term. So, it was hypothesised that the students who participated in the intervention at the beginning of the academic term would show an improvement in, or at least a stabilisation of, their psychological health after the intervention, in contrast to the rest of the students who would have poorer psychological health toward the middle of the term.

It was not appropriate to conduct an interventional study (Study 5) on the intended intervention, which is a self-development coaching program, before two prerequisites were met: first, a thorough understanding of the concept of self-development coaching programs, especially when they are not well-understood in the extant literature. This was conveyed in Study 1, which presented a literature review about the field of self-development coaching programs. The literature review illustrated that such programs aim to improve individuals in a multidimensional manner. Second, the conducting of a pilot study to measure the conductibility of a future randomised controlled trial (RCT), and to gain initial results of the intervention outcome to support the intended RCT. In fact, the pilot study was a critical step towards providing valuable feedback to the protocol of the RCT. It also gave promising outcomes for the intervention. Without the pilot study, the conduct of, the quality of, and the resources for the research would be negatively impacted.

Finally, the RCT (Study 5) was implemented and the results helped to explain the effect of the self-development coaching program under investigation on the target population’s psychological health and academic performance. The results of the RCT alone gave indications of only a short term improvement from the program in comparison to the active group. Nonetheless, these results had other implications in the light of the other studies, as the RCT showed that both the intervention group (IG) and control group (CG) showed improvement after the intervention at the middle of the academic term, which contradicted the normal trajectory of psychological health illustrated in Study 3. This point will be discussed thoroughly later in this chapter. In short, each presented study was essential to build an important segment of this thesis and add vital information to this project.

**Answering the Research Questions**

The results of Studies 1 to 4, give answers to the research questions. The following section will discuss the answer to each question with recommendations for future research.
Question 1: What is the prevalence of depression, anxiety, stress, self-efficacy and life satisfaction among preclinical medical and dental students in Makkah, Saudi Arabia?

The Study 2 results indicated that two thirds of the students in the study suffered from depression, anxiety and/or stress. Almost one-third of the students in total were experiencing severe stages of depression, anxiety and/or stress. When the prevalence results of this study are compared with those of other studies investigated in non-Saudi and Saudi populations, as reviewed in Chapter 2, this study’s prevalence of depression (69.9%) is higher than that for similar non-Saudi studies of medical and dental students (2.7% to 56.2%) (Ahmed et al., 2009; Alvi et al., 2010; Dahlin et al., 2005; Dyrbye et al., 2007; Galán et al., 2014; Jadoon et al., 2010; Lee et al., 2013; Mancevska et al., 2007; Newbury-Birch et al., 2002; Prinz et al., 2012; Quince et al., 2012; Roh et al., 2010; Schwenk et al., 2010; Takayama et al., 2011); and Saudi studies of medical students (36.4% to 66%) (Al-faris et al., 2012; Ibrahim et al., 2013; Inam, 2007). Notably, our prevalence of anxiety (66.4%) was still within the highest range of prevalence found in similar non-Saudi studies of medical and dental students (11.5% to 70%) (Ahmed et al., 2009; Akvardar et al., 2004; Bassols et al., 2014; Bunevicius et al., 2008; Chandavarkar et al., 2007; Eller et al., 2006; Inam et al., 2003; Jadoon et al., 2010; Karaoglu & Şeker, 2010; M. S. Khan et al., 2006; Mancevska et al., 2007; Newbury-Birch et al., 2002), and Saudi studies of medical students (44% to 68.2%) (Ibrahim et al., 2013; Inam, 2007). Similarly, the prevalence of our stressed students (70.9%) was within the highest range found in similar non-Saudi studies of medical and dental students (17.6% to 72%) (Abu-Ghazaleh et al., 2011; Aktekin et al., 2001; Newbury-Birch et al., 2002; Niemi & Vainiomäki, 2006; Saipanish, 2003; Sreeramareddy et al., 2007; Yusoff, Yee, et al., 2011), and Saudi studies of medical students (48.6% to 71.9%) (Abdulghani et al., 2011; Al-Dabal et al., 2010; Sani et al., 2012).

Nevertheless, the impact of using different instruments, cut-off points and criteria for abnormal psychological distress should be taken into consideration when comparing our results of this study with those of the extant literature. In fact, the number of studies that used DASS21 on medical and dental students is not abundant. Discussing studies that used a similar instrument in Saudi Arabia and in similar socio-cultural populations was considered important for better comparisons to be made. Accordingly, the results of this study were compared with those of Balaha et al. (2012) who investigated female medical students in King Faisal University, Al-Ahsaa in Saudi Arabia using DASS21. Balaha et al. found the prevalence of depression, anxiety and stress to be 19%, 29.6%, and 31.6% respectively, which were lower than the prevalence found in the current study. This difference might be attributed to the inclusion criteria of Balaha et al. study that
included only medical female students with pre-menstrual syndrome. The difference might be attributed also to the different educational environments in each university used for both studies. Unfortunately, there was no other Saudi study that used DASS21 to assess medical or dental students for better comparison.

Furthermore, the results of Study 3 were compared with those of other studies that used DASS21 in a similar socio-cultural country (such as Malaysia). Using DASS21, the prevalence of Malaysian medical students’ depression, anxiety and stress ranged from 5.9-41.2%, 50-68.4%, and 15.3-32.1% respectively during different times of the academic year (Yusoff, Abdul Rahim, et al., 2013). The prevalence of depression, anxiety and stress in this Malaysian study were again lower than the prevalence found in our study. This might indicate that the students in Makkah, in Saudi Arabia, are experiencing more psychological burden than students in other cities in Saudi Arabia and in other similar countries, but more research is needed to verify these findings.

It should be noted that with regard to further comparison of the results of the current study, there was no other study in Saudi Arabia or in a similar country that used DASS21 to assess dental students. This can be critical to the understanding of the current results when comparing them to other studies’ findings.

A point to be noticed as discussed in the literature review chapter, is that European populations have relatively better psychological health among medical and dental students than other populations. One suggested reason is that the western educational institutes provide supportive educational solutions to students such as student support centres, counselling and psychological services to cope with psychological burdens. This type of support might not be well-established and utilised in Saudi universities in general.

The “satisfaction with life” results found in this thesis fall within the same range as those of the Arab university student population (Abdel-Khalek, 2013; Pavot & Diener, 2008) and are similar to those for other non-Arab medical student populations (Boparai et al., 2013; Samaranayake & Fernando, 2011). In terms of self-efficacy, the results for this study were slightly lower than those for the non-Arab populations (Schwarzer, 2014), but similar to those for other Arab university students (Al Khatib, 2012). However, for further comparison, the author could not find a study that used SWLS or GSE instruments in Saudi Arabia or in a similar country on medical or dental students. It is important to note that the present investigation assessed self-efficacy using a validated instrument to measure only self-efficacy, which was in contrast to similar articles that measured self-efficacy as a scale sub-domain; this strengthens the validity of our results.
Results from Study 2 had a secondary outcome related to depression among the target population. Study 2 results showed depression had a significant negative relationship with academic performance, that is, as student’s depression increased, their academic performance decreased. This accords with the literature (Hamaideh & Hamdan-Mansour, 2014; Roh et al., 2010).

From the discussion above, the target students seem more likely to be depressed than their peers, both locally and in other countries. Anxiety and stress levels were among the highest ranges found in non-Saudi studies but similar to those found in other local studies in Saudi Arabia, while satisfaction with life and self-efficacy levels were normal. The underlying reasons for Saudi students experiencing higher distress than other populations might be attributed to many factors such as differences in educational systems, educational language (English) challenges for Arabic-speakers, and/or to variations in the psychological support offered by the educational environments. However, such reasons cannot be confirmed by the data in this thesis.

The answer to the first research question as suggested by the findings of this study, lead to a recommendation to take medical and dental students’ psychological health in Saudi Arabia more seriously, and to find approaches to deal with this problem starting from preclinical years. Future research can be directed toward multi-national and Saudi multi-centred studies, using a unified instrument to compare the psychological health status among medical and dental students and the relationship between that status and educational environments and provided support. This could be followed by a qualitative study to investigate, in depth, the sources of psychological distress and students’ coping strategies. It is also recommended that future studies include preclinical and clinical students from both faculties. This would allow researchers to quantify the magnitude of the psychological distress on a national scale, with an understanding of the underlying factors. It could also engender further impetus towards improving the current medical and dental educational environment by providing more support to students.

**Question 2: Do levels of depression, anxiety, stress, self-efficacy and life satisfaction change prospectively in the same academic year among the targeted population?**

Study 3 presented an analysis of the follow up of students from the middle of the first term, up to the beginning of the second term. The results indicated a significant improvement in depression, anxiety, stress and satisfaction with life, whereas self-efficacy did not change. This finding is supported by the findings in existing literature (Yusoff, Esa, et al., 2013) as discussed in Study 3, Chapter 6.
Therefore, the variability in the cross-sectional studies’ results might be related to the time at which measurements were taken; for example, according to thesis data, the percentages of students who were classified as depressed, anxious, and stressed, were 69.7%, 67.5%, and 71.9% respectively at the middle of first term, as shown in Study 2. This percentage became 38.5%, 57.7%, and 51.4% respectively after the follow up at the beginning of the second term. Although these percentages were not included in Study 3 due to the different analysis used, yet they clearly illustrate the importance of the timing factor and indicate that some of the distress is transient.

In accordance with the results presented in this thesis, it is recommended that faculties conduct students’ supportive activities and workshops to teach students to cope with psychological distress in the middle of the term, when students need it, rather than at the beginning. It is also recommended that the time when measuring students’ psychological health be considered as an important factor that influences the results. This information should be mentioned in the methodology section of future studies and should be taken into consideration when comparing the findings from different studies that assess students’ psychological health. Future research can be directed to follow medical and dental students in the Middle East through their different academic years and into their professional life, as this point was not covered in the literature and represents a gap in knowledge.

**Question 3: What are the groups at risk of higher depression, anxiety, and stress; or of lower life satisfaction and self-efficacy among the target population?**

The analysis in the studies of risk factors included the faculty, gender, academic year and family income as subgroups and the interactions between these factors. Marital status and nationality were not investigated as the percentage of married and non-Saudi students was very low in the sample group.

In general, and according to Study 2, it was found that the female, medical, and third year student subgroups had lower psychological health status, and thus were the groups at higher risk of psychological distress when psychological health status was measured in the middle of the first term. The suggested reasons for their low status were discussed in Study 2. According to Study 3, these subgroups were to recover the most at the beginning of the second term and after the one-week of vacation, as discussed in Study 3. This finding might indicate the distress within these subgroups was not persistent, but rather transient and caused by events and time. An alternative explanation might be that the students in worse situations might respond more significantly after the vacation than the others. According to Study 3, dental, male, and second year students had relatively
better psychological health in general. Those subgroups seemed more resistant to change as they had less improvement after follow-up relative to medical, female and third year students. The reason for this state of affairs needs further qualitative study.

More particularly, and in terms of faculty and gender variables, Study 2 stated that there was a difference in depression, anxiety and stress only with the interactions between gender and faculty. There were two aspects to these interactions. First, females in the medical faculty experienced higher distress than the females in the dental faculty, and the males in the dental faculty had higher distress than the males in the medical faculty. In other words, the difference between medical and dental students using faculty variable alone, was not statistically significant. This is in contrast with findings from the literature that indicate dental students in general are more distressed than medical students (Lee et al., 2013; Mane et al., 2011; Murphy et al., 2009; Newbury-Birch et al., 2002; Prinz et al., 2012). This inconsistency between the current study’s results and those from the literature might result from the author’s having used a different statistical analysis model from that used in the literature, as he used a linear general model that allowed for interactions to be analysed. Or, it might be a real difference due to the different educational system in Saudi Arabia, as the current results might be the first, to the author’s knowledge, to compare between medical and dental students’ psychological health in the Middle East and in Saudi Arabia specifically. Thus, in future studies, investigating the interaction using regression models is recommended for making better comparisons.

The second aspect to the interactions between gender and faculty, is that medical females were more distressed than medical males, and dental males were more distressed than dental females. By comparing the current study’s results with those of medical studies, this result aligned with those from the literature (Abdulghani et al., 2011; Al-Saleh et al., 2010; Dahlin et al., 2005; Dyrbye et al., 2006; Inam, 2007). Nevertheless, the current results, when compared with those from dental studies, are contradicted by most of the literature (Al-Saleh et al., 2010; Al-Sowygh, 2013; Alzahem et al., 2011; Mathias, Koerber, Fadavi, & Punwani, 2005; Polychronopoulou & Divaris, 2005). Only a few studies found dental male students to be more depressed in clinical years (Newbury-Birch et al., 2002), and more stressed in general (Acharya, 2003) than dental female students. It is hard to explain the reason for this in the current study’s results. However, male dental students at UQU were noticeably more driven to involve themselves in multiple extra-curricular activities– which might increase their need for more time to study and subsequently increase their psychological burden. From another perspective, it might be difficult to attribute this finding to other socio-cultural variables because medical male and female students in this study’s sample, who
experienced the same socio-cultural environment, did not show similar gender effects. Thus, the exact reason behind the finding cannot be revealed by this study’s data because it was not qualitative in nature. The finding needs to be verified by other research, and could be an interesting area for further qualitative investigation.

In terms of the academic year, our results in Study 2 indicated that the students of the third year were more distressed and less satisfied than those of other years, which aligned with some literature (Al-Saleh et al., 2010; Saipanish, 2003; Schwenk, et al., 2010) and contradicted other studies, which stated that other years were more distressful (Galán et al., 2014; Sugiura et al., 2005). In fact, it seems that the between studies comparison of the effects of the academic year between studies is more challenging than the previous factors. This is because some universities teach medicine/dentistry for between four and seven years, which makes the curricula very different between these different institutes. For example, the clinical years might start at the second year in a four-year program, while starting at the fourth year in a seven-year program. So, it is recommended that future studies compare between the preclinical, transitional-to-clinical year, and the clinical year. Also, different faculties at different universities might have different curricula and workloads, and these can be other confounding factors. Thus, it might be better comparing the academic years across similar educational curricula or length of programs.

The identification of the existence of vulnerable groups leads to a recommendation for the stakeholders to invest in designing special programs targeting the most vulnerable students. Such identification might also direct future research towards qualitative studies to investigate reasons for those identified subgroups having worse psychological health than others, and this might later be used as a framework to tackle students’ problems, based on their needs.

**Question 4:** Does the self-development coaching program “How to Be an Ultra-Super Student” affect the following variables among preclinical medical and dental students in Makkah, Saudi Arabia: depression, anxiety, stress, self-efficacy, life satisfaction, and academic performance?

**Question 5:** Is the effect of the self-development coaching program “How to Be an Ultra-Super Student” influenced by:

- Levels of credibility/expectancy towards a self-development program;
- Coaching program characteristics: the level of relevance, acquiring experience in the program content, and satisfaction;
• Coach characteristics from the participants’ perspective: abilities to influence emotions, use of personal experience, considering the coach as a role model, levels of empathy, persuasion, confidence, attraction level, and motivation.

These questions are the most important in this thesis. The fourth and fifth research questions are linked, thus they were discussed together. Studies 1, 4 and 5, and Chapter 9 were to answer these questions and they provided three considerations, to be discussed below: first, the difference in psychological health improvement between the interventional group (IG) and control group (CG); second, the trajectory of change of both groups; and third, the potential impact of the program on academic performance. Practicality and cost of answering these questions will also be discussed.

Impact of the Intervention on students’ mental health status

With regard to the first consideration, Study 5, Chapter 8 indicated that the investigations into the self-development coaching program “How to Be an Ultra Super Student” (HBUSS) had only a short-term significant effect on depression and anxiety of the students in the IG compared to those in the CG. Compared to the CG program, the IG program had no short-term effect on stress, self-efficacy or satisfaction with life. Also, the intervention had no long-term effect on all the psychological constructs investigated in this study when compared to the control program.

It should be noted that there was no significant difference between any of the variables of the coaching program and coach characteristics (CPCC) or the sum of the measured subscales, as illustrated in Chapter 9. However, it is not known if the results might change if different coaches were used to deliver the HUBSS program. Also, credibility and expectancy were not significantly different between the two groups before the intervention, indicating that the intervention results were not influenced by cognitive or emotional preconceptions. However, credibility and expectancy levels were significantly higher for the IG and significantly lower for the CG after the intervention. This indicates that the students do realise which program is useful.

The main finding from Study 5 suggests that the self-development coaching program effect is only transient for short-term periods and not a durable effect for the long term. It also indicates that the marketing claims for (massive) improvement in such programs might be an overestimation. Furthermore, it also suggests that some of these programs, as detailed in Study 1, might be over-priced relative to the benefits gained. Nevertheless, in the light of the detected short-term improvement, this finding stands against those critics who accuse these programs of being totally fraudulent.
The finding of this study was different from that of other studies investigating self-development programs (Fernros et al., 2008; Holm, et al., 2010) that found a long duration of improvement among their samples (3–6 months). This difference could be due to several reasons, including: different study design, different program duration and content, different population, and different approaches, as explained in the following paragraphs.

The RCT design in Study 5 was used as the “gold standard” of research design to validate the impact. Having a parallel active control group was crucial and superior to similar studies (Fernros et al., 2008; Grant, 2001b; Holm et al., 2010) that used waiting groups. The present study was actually the first, to the author’s knowledge, in this field to use a parallel placebo group. In fact, it is suggested that the results of the current study would be similar to the results in the literature if a waitlist group were used in this study instead of an active control group. In other words, if this study had been designed to utilise a waitlist instead of an active control group, it is suggested that the CG students would have no improvement in their psychological health when compared to their baseline levels in the short and long terms, while the IG students would show an improvement. This could be explained by the intervention having an actual short and long term improvement. Thus, using an active control group is important for measuring the real impact of such a program.

Also, the investigated programs in this current study and the literature were different in terms of duration and content. The programs in the studies by Fernros et al. (2008) and Holm et al. (2010) were conducted over one to three months, while this program was only a two-day program. The programs of Fernros et al. (2008), Holm et al. (2010), and that of our study, had different content and tackled different points by using different approaches, which makes it difficult to compare them precisely and to draw any confirmable conclusion as to the effect of all self-development coaching programs.

The population of this study was different from that used in the Fernros et al. study (2008), but similar to that used in the Holm et al. study (2010), which investigated Norwegian medical students. This is because medical and dental students do face numerous challenges that can cause high distress (Alzahem et al., 2011; Dyrbye et al., 2006) before the beginning of any intervention. Nevertheless, it seems that the medical and dental students in this study were different from the students in the Holm et al. study because, as was indicated in Chapter 2, European medical and dental students experience lower distress than those from other countries. Thus, the environment for this study’s population was different from others, and such a program as the one used here might
have a low impact if used on a population with a normal level of psychological burden or on a population with fewer challenges.

One last difference between the current study and others is that the students attended the interventional program free of charge in addition to having other incentives to attend, in contrast to Fernros et al.’s study participants who paid to attend the interventional program. Self-development coaching programs usually have entry fees and this might reflect on Fernros et al.’s participants’ attitude to take the program information and the techniques more seriously and apply it in their lives rather than attending passively. In the Saudi culture there is a perception that free products or programs are of a low quality in general. The data from this thesis cannot provide a validation as to the effect of this point, especially when there is no data on students’ compliance in using the material provided in the program in their lives.

These differences illustrate that the results of this thesis cannot give a generalisable conclusion to other self-development coaching programs or other populations, but rather, they indicate that the HBUSS program has a short-term effect on psychological health when compared to its effects on the active CG from among the population of medical and dental students.

So, why was the effect of HBUSS not durable in the thesis program when compared to CG program? It is considered likely that due to the nature of the program, to not having follow-up meetings with participants to receive feedback, and to the fact that students did not apply and use the program material after the program, there was a lesser durability of effect. The large number of participants and the relatively long time of the interventional program per day, might made it difficult for the participants to concentrate. This might be another possible reason to affect the intervention impact and durability. Also, it is suggested that the students had the benefit of the interventional program, but that benefit was washed out by the intensive academic events, such as the series of examinations during the academic year. As future research direction, more studies are recommended to provide a body of knowledge to give broader answers, while taking into consideration the control group type, program’s duration, program’s content, and program’s fees as important variables to be discussed. Furthermore, it is recommended to conduct a qualitative, interview-based evaluation to acquire in depth understanding of the impact of such programs.

**Follow up after the intervention**

The second result is about the changes that occurred in IG and CG after the intervention. It was hypothesised that the students in the IG only would have significant improvement in their
psychological health after the intervention, whereas the students in CG, according to Study 3, would have significant deterioration in their psychological health when compared to their baseline measurement, or at least they would have no change. However, the results in Study 5 indicated that depression, anxiety, stress, and satisfaction of life were improved significantly after the intervention by a week for both IG and CG. Also, and despite the relapse which happened five weeks after the intervention, depression, anxiety, and stress were still at significantly better levels than immediately before the intervention for both groups. These findings suggest that the placebo effect improved the psychological health status among students significantly over the short- and long-term, while the authentic effect of the HBUSS program made more significant improvement in IG only for a short period of time, and in the areas of depression and anxiety only.

Nevertheless, the improvement in the IG should be regarded cautiously, due to the probability of a contamination effect, because the students of both groups do study in the same classes together. As a result, potentially the students in the CG were able to gain some knowledge of the HBUSS program content from their friends who attended in the IG. It should be noted that with the current data, it is hard to validate that any contamination did occur or not. This was a known limitation in the study design and was taken into consideration before starting the RCT. However, it was considered the best and most practical design. The alternatives were:

1) Using students from some other university to receive the placebo program; however, this was expected to produce another bias in students studying in a different educational environment;

2) Using students in the successor year to receive the placebo program. This was unfeasible due to the long time frame required for data collection (2 years) which exceeded the limited timeframe of a PhD project. This design might also have encountered other problems due to the continual changes in the educational system of the medical and dental faculties every year, resulting in non-comparative educational environments for IG and CG.

Thus, the current design was chosen and the potential contamination bias was acknowledged. It is recommended that future studies use students from different universities with matched educational systems, and that they conduct population-based randomisation for better study quality.
**Intervention and academic performance**

Despite the students in the IG and CG having an improvement in their academic performance after the intervention in comparison to each group’s baseline, the magnitude of improvement was not statistically different between IG and CG. So, it is hard to argue that the academic improvement in the IG students could be attributed to the intervention impact. It is suggested that the students do expend more efforts in the second term compared to the first term to improve their overall grade point average (GPA). However, it is recommended that a waiting group be added in any future study to enable the making of further comparisons, and to verify the minor chance that both the interventional and the placebo program were equally responsible for improvements in academic performance.

**The Intervention Costs**

An interesting point to highlight is the financial cost, which was AU$4,636 ≈ 17,895 Saudi Arabia Riyals (SAR), (bearing in mind that AU$1 = 3.86 SAR at the time of data collection). Three programs (pilot intervention, intervention, and placebo programs) were conducted to involve all the expected participating students, which was 471 students (49 for Study 4 and 422 for Study 5). In fact, when dividing the total expenses of programs by the total number of students expected to show up on the designated days, it is found that a self-development program can cost AU$10 ≈ 38 SAR per student. If the coach’s usual fees for a HBUSS program, which is around AU$2,590 ≈ 10,000 SAR, is taken into account, a program for 100 students would cost AU$3,575≈ 13,800 SAR. To extrapolate these costs, it equals AU$ 35.75 or 138 SAR per person. Bearing in mind that the cost can be less for a higher number of students per program, the cost per individual seems to be affordable for students, as would be the total cost for a large educational or health organisation body. So the financial cost does not seem a barrier to conducting such programs given, using a program for a large audience. However, the program cost effectiveness is a matter for discussion with stakeholders for possible future implementation.

Despite the fact that psychological treatment by a psychological specialist is an optimal solution for psychologically affected students, it can be argued that self-development coaching programs are easy to conduct and financially acceptable as a palliative option, rather than the conventional psychological treatment in Saudi Arabia. This takes into consideration the high number of students that could require a large number of specialists, bearing in mind the shortage of health specialists in Saudi Arabia (Almalki et al., 2011). Also, self-development coaching programs might be more suitable for the Arab population who have cultural barriers to seeking professional...
psychological care (Gearing et al., 2013). Nevertheless, psychological treatment is seen as the recommended regimen for such distress, especially for students with severe or even moderate symptoms.

In summary, in comparison to the control group, the self-development coaching program seems to have a short-term effect which is promising and can be recommended to be used to improve the psychological health of medical and dental students with acceptable cost. According to the answer of the fifth research question, future research direction should focus to conduct more scientific work to build a body of knowledge, as such programs seems to be a new venue to help psychologically affected medical and dental students. As a sum of the recommendations above for future interventional studies, it is recommended to use an active (placebo) control group for comparison with a self-development coaching program group, as it is vital in this research arena not to be misled by the placebo effect. Also, adding a waiting (non-active) group is important to add another dimension to the results, by plotting the normal trajectory of the participants’ psychological health and expected academic performance. Use students from different but matched universities and the use of population-based randomisation can be important to avoid the potential of contamination bias in future studies. Different self-development coaching programs in the content, duration, presence of feedback to the participants, coaches’ characteristics, and presence of fees are recommended for investigation, as these factors might be influencing to the program impact. It is suggested that this line of future research direction can produce an evidence-based approach to be incorporated into educational environments in a systematic way by stakeholder to help medical and dental students and to verify the effect of self-development coaching programs.

Methodological Aspects

The following section discusses some methodological aspects, including the participants, study protocols, missing data and the instruments used.

Participants

Preclinical medical and dental students in Makkah, Saudi Arabia, were used as the main population; however, the students in the clinical years were used in the pilot study to prevent contamination of the intervention by the students’ perceptions and expectations. The population
used was not representative of all medical and dental students in Saudi Arabia, and thus the results cannot be generalised to Saudi Arabia on a national scale.

The students who dropped out in Study 3 were not statistically different from students who continued the follow up in any variable. Interestingly, only 2 students dropped out (0.62%) in Study 5. This is considered to be an excellent percentage in an RCT study design. This can be explained by the research assistants’ good efforts and their becoming more experienced in following-up participants when they had to receive feedback after the pilot study. The response rate of the thesis’s participants is considered to be good in general, except for the pilot study. Accordingly, the response and dropout rates are less likely to be a source of bias in the studies.

Missing Data

Managing missing data was not discussed thoroughly in any article. The pilot study had no missing data. Only 0.66% of the values of the main data used for Study 2, Study 3, and Study 5 was missing. Missing data analysis was performed for the main data in two data sets: the questionnaire data and the academic performance data. In terms of the students’ academic performance, the Little MCAR test has a p-value of .154. This means that data were missing completely at random. The expectation maximization (EM) method (Allison, 2002, p. 27) was used to replace missing data.

Regarding the other data retrieved from the questionnaire, only 0.16% of data were missing. However, the Little MCAR test was found to be significant, p-value < .001. Thus, data here were not missing completely at random. It was more efficient to use the multiple imputation (MI) method to replace missing values in this case. However, according to Lin (2010) there is no serious difference between EM and MI when there is a small percentage of missing data. Thus, the author used EM again to replace missing data in the questionnaire because it was less complicated to analyse in comparison to MI. Replacing the missing value was preferred to deleting missing cases (leastwise deletion) despite the small percentage of the missing values. In sum, missing data were minimal and were handled accordingly.

Research Strengths

The strength of this project lies in the study’s design, the multiple psychological constructs investigated, instruments used, samples used, and the novelty in addressing gaps in knowledge that have not been investigated in current literature. These points are discussed in the following.
The major strength of this research is the study design of RCT, a “gold standard” of scientific evidence (Gordis, 2000). The RCT presented used a placebo control group, was partially blinded, had multiple follow-ups, and was preceded by a pilot study to ensure the quality of the conducting of the RCT, and it was registered in the Australian New Zealand Clinical Trials Registry (Appendix V). It should be mentioned that Study 5 was written according to CONSORT guidelines of interventional studies, and Study 3 was written according to STROBE guidelines of observational studies.

Furthermore, the thesis’s articles investigated multiple psychological constructs of both negative and positive aspects. This could differentiate the work from previous literature that mostly used one or two psychological constructs to measure, or that focussed on either the negative or the positive aspect.

Moreover, the instruments used are commonly used internationally and have excellent psychometric properties and were chosen to avoid instrument bias. These instruments are relatively short and require about 5–10 minutes to answer, which is less likely to make participants give random answers.

Also, the project’s sample size is considered to be excellent relative to that of previous similar studies. The dropout rates of Study 3 and Study 5 were considered very minimal, reflecting the efforts of training, organising, and allocating research assistants to avoid participant attrition.

Finally, this research adds to the knowledge by being, to the author’s knowledge, the first to:

1) conduct RCT on medical students to improve their psychological health in the Middle East;
2) conduct RCT with dental students to improve their psychological health in the world;
3) use a parallel placebo control group in the RCT, in contrast with other coaching and self-development interventions in the world;
4) investigate and report, in Saudi Arabia, on the prevalence of dental student psychological health, using international instruments;
5) investigate the positive psychological aspects of medical and dental students in the Middle East;
6) follow up on medical students’ psychological health in the Middle East, prospectively;
7) compare medical to dental students in several psychological constructs in the Middle East.
Research Limitations

The following paragraphs discuss the thesis limitations in general, bearing in mind that each article already published had its own limitation section. Some of these were discussed earlier in this chapter, and will only be highlighted here. The limitations include: lack of external validity, non-representative self-development coaching program; self-reported instruments; randomisation by the research investigator; potentiality of contamination bias; unmatched criteria between the intervention and control programs; lack of enough long term follow ups; and lack of clarity as to the influential part of the intervention. Each of these limitations is discussed below with recommendations for future research.

In terms of participants, the findings of the four articles cannot be generalized to all Saudi medical and dental students as the sample was not representative of all medical and dental students in Saudi Arabia. A random sample was not used, but rather, a purposefully clustered sampling method was used to invite all the students in the preclinical years to participate, which might have resulted in participation bias for Studies 2 and 3. This sampling method aimed to ensure a sufficient sample size for having acceptable statistical power. It is recommended for future research to use a random sample from medical and dental faculties on a national level in Saudi Arabia to generate more representative results.

Also, the investigated program, in Study 5, cannot be representative of all self-development coaching programs. It is very hard to argue that the current results are conclusive as to the effectiveness of all self-development coaching programs. In fact, “How to be An Ultra Super Student” is a program that has specific objectives that are different from those of other programs that might focus on different topics, such as interpersonal relationships or life planning. The results of this study add to the literature body of knowledge, but more studies investigating different programs are recommended and required for quantifying the effectiveness of self-development coaching programs.

Despite the fact that DASS21 was found to differentiate between psychiatric patients and non-psychiatric patients (McDowell, 2006), and had extant usability on clinical patients (Henry & Crawford, 2005), DASS21 and the other psychological instruments used in the studies were self-reported. No clinical assessment was conducted to measure the participants’ psychological status. This is because using clinical assessment was expected to add more complexity and expense to the
cost of the project, which might have made it unfeasible. However, clinical evaluations by a psychologist or psychotherapist can give more accurate measures of the students’ psychological status, and they are recommended for use in future studies when resources (such as time, money, and psychological professionals) are available.

Regarding the RCT, the principal investigator was previously the coach who conducted the intervention and he was also responsible for the randomisation. This point was acknowledged during the methodology chapter, and was highlighted as a limitation in Study 5. However, using a validated instrument, a control group, partial blindness, and working under supervision with a transparent study protocol, were crucial in minimizing the bias potentiality of this fact. Independent coaches and randomisation by a third party are highly recommended in the future as they add extra quality to such intervention.

Another limitation of the study was the chance of contamination bias in the RCT, which was discussed earlier. To avoid contamination bias, it is recommended that future studies use cluster RCT using students from different universities that share a similar educational environment. It is not recommended to use cross over RCT design, as it can potentially result in a carryover effect that needs a long time to diminish in such an intervention.

The length of time for the intervention and control programs to run was unmatched between the two. The control program was designed for one day to overcome the high potentiality of drop out from among the control group’s participants on the second day when the students found the program to be not very useful. This potentiality was supported later when it was noticed that there were significant reductions in the students’ expectancy and credibility levels within the CG, as detailed in Study 5. However, it is recommended that the duration of the intervention and control programs in such studies in the future be matched, and that further precautions be taken to avoid drop out potential.

One of the main limitations was that the long term follow up in the RCT study took place only five weeks after the intervention, whereas similar studies (Fernros et al., 2008; Holm, et al., 2010) followed up the participants several months after the intervention. There was a need of more follow up points to investigate the long term effects of the intervention after three, six and twelve months. This step was difficult because the students were expected to go into series of examinations that started from week 10 in the second term until the final year examination. Students were less likely to continue with the program in such circumstances. Also, it was hard to follow up the students after three months from the intervention because they would have been into the end of year
vacation and it would have been hard to communicate with them. So, it is recommended for future studies to conduct such interventions in the first term and follow up the students during the first term, the second term, and the subsequent year. This is very important to provide more details on the longevity of the effects of the self-development coaching program.

Finally, there was a level of complexity in the intervention that made it difficult to know what part of the intervention was responsible for the improvement. For example, the time management module, dealing with the examination module, and/or using the CD, could be, alone or combined with others, the most influential part of the intervention. It was also not known what level of usability the program content had. It is possible that the students did not continue to use the material given in the program after a couple of weeks of the intervention, and that might explain the students’ psychological health relapses. However, such information was not investigated in this research. Thus, it is recommended for future studies to follow up students’ use of program material and CD content to gain a better understanding of the impact of such a self-development coaching program and its components.

**Conclusion**

The purpose of this doctoral study was to evaluate the positive and negative psychological status of preclinical medical and dental students in Makkah, Saudi Arabia. It also aimed to evaluate the impact of a self-development coaching program on the psychological health and academic performance among the targeted population. The significance of this research project comes from three aspects. First, the importance of the population investigated, as they have never been investigated before within the scope of this study. This population is the future core of the healthcare workforce who deals with millions of Muslim pilgrims every year in Saudi Arabia. The second aspect is the importance of the interventional study design, which evaluated the popular practice of attending self-development coaching programs, in the light of a paucity of similar studies. Finally, the importance of this research lies in filling multiple gaps of knowledge that were identified through the literature review.

Five studies were undertaken to answer the research questions. The studies contributed to knowledge by finding that the prevalence of psychological distress among Umm Al-Qura University’s medical and dental students was higher than, or similar to, the highest prevalence of distress among local Saudi students and students of other countries. It also showed that the positive
aspect of psychological health among the students was normal and similar to that of other populations in other countries. In addition, psychological health was found to fluctuate during the same academic year among the students. Female, medical and third year students were found to be the highest at-risk groups, and the groups that recovered the most after the between-terms vacation.

These findings have several implications. The findings urge the provision of support to medical and dental students in general, and suggest that serious actions be taken by stakeholders to lower the burden on those students. This support should be directed to all preclinical medical and dental students in general, but it would be well to have an increased focus on female, medical and third year students rather than on others. According to the research results, adding vacation days within the term might be helpful for students to improve their psychological health.

More importantly, the results from the randomised controlled trial showed that the investigated self-development coaching program improved, for a short time, depression and anxiety. This improvement was significantly more than the improvement found in the active control group. The program also showed a long term improvement in psychological health, but it was not significantly different from the improvement found in the active control group. The academic performance of the interventional group was not improved significantly more than that of the active control group.

These are important findings, as they show that a self-development coaching program can be used as a palliative psychological approach to help preclinical medical and dental students cope with psychological burdens. According to the overall results and the findings of this project, it is recommended such programs be utilised at the middle of a term when exams take place. It is also recommended vulnerable subgroups (female, medical and third year students) be targeted by such programs and that programs be re-designed to suit these subgroups.

Furthermore, such results contribute to the knowledge to indicate that self-development programs do actually contribute to participants’ improvement; but at the same time, they show that some of these programs’ claims to produce durable improvement might be overrated. As future direction for future studies, it is important to encourage researchers to conduct further interventional studies to generate an evidence-based body of knowledge in regard to self-development coaching programs.


References


BBC— see British Broadcasting Corporation


References


OPEC—see Organization of the Petroleum Exporting Countries.


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References


WHO—see World Health Organization.


Appendices

Appendix A: 2012-2013 Medical and Dental Faculty study calendar at Umm Al-Qura University

Legend
- First day of the first term
- Hajj Vacation
- The pilot intervention
- P-T1
- P-T2
- T1
- Examination time
- In-between terms vacation
- First day of the second term
- RCT
- T2
- T3
- T4
- Mid-Term vacation
Appendix B: Consent form for the main study (English version)

**PARTICIPANT INFORMATION FOR QUT RESEARCH PROJECT**

**Questionnaire – Main Study**

**The Effect of a Self-Development Coaching Program on Psychological Health and Academic Performance Among Dental and Medical Students in Saudi Arabia**

**QUT Ethics Approval Number 1200000411**

**RESEARCH TEAM**

- **Principal Researcher:** Khalid Aboalshammat  
  - PhD student  
  - School of Public Health and Social Work, QUT
- **Principal Supervised:** Dr Janet Hou  
  - Senior lecturer  
  - School of Public Health and Social Work, QUT
- **Associated Supervisor:** Dr Esben Strold  
  - Senior Lecturer  
  - School of Psychology and Counselling, QUT

**DESCRIPTION**

This project is being undertaken as part of PhD study for Khalid Aboalshammat who is a PhD student in School of Public Health and Social Work, Queensland University of Technology (QUT).

The purpose of this project is to evaluate the effect of self-development coaching program on well-being and academic performance among dental and medical students in Saudi Arabia.

You are invited to participate in this project because you are studying medicine/dentistry at your 2nd/3rd year of study. In addition, if you are in treatment for any mental health problems then we would ask you not to participate in this study.

**PARTICIPATION**

Your participation in this project is entirely voluntary. If you agree to participate, you can withdraw from the project at any time without any comment or penalty, and the identifiable information already obtained from you will be destroyed. The non-identifiable data of all participants might be used in the future for further studies. Your decision to participate or not will have no impact upon your current or future relationship with QUT, your university or any other associated external organisation.

Participation will involve attending one of two programs randomly at the 2nd semester at Umm Al-Qura University of the current year and completing 59 items in anonymous questionnaire four times during the academic year. The 1st program will involve attending a 2-day course (How to be an Ultra Super Student) on the 1st week of the 2nd semester on the weekend (31st Jan and 1st of Feb 2013). The first day will be from 9:00 am to 5pm and the second day from 3pm to 10pm. The second program is (Learning and Success in Health Faculties) which will last 4 hours from 5pm to 9 pm on the 1st week of the 2nd semester at 29 January 2013. Both programs will take place in (King Abdulaziz Historical Hall) in Al-Madinah. Both programs are full of information that aims to improve your academic performance. Each program will involve a lecture presentation, small individual exercises, and a CD to listen after the course. Each program will involve around 50-100 participants. Your degree of self-disclosure during any of the programs is totally voluntary, and there is no obligation to disclose any personal information unless you want to. The coach in both programs will be Dr. Khalid Aboalshammat, a dentist, master of public health holder, PhD candidate, and a certified trainer from Technical and Vocational Training Centre in Saudi Arabia. Filling each questionnaire will take approximately 15 minutes, and each participant will fill it four times during the academic year: before the course at the 12th week of the 1st semester, immediately before the course, after the course at the 2nd week of the 1st semester, and after the course by a month at the 5th week. The questionnaire will include questions about depression, anxiety, stress, general self-efficacy, satisfaction with life, program's expectancy and credibility, as well as demographic information and your perceptions of the coach and coaching characteristics questions. All responses will be held anonymous and the coach will not know what your individual responses are.

To participate in this project, you will need to sign on this consent before 28th of December 2012. This consent is considered as a formal permission to the research team to retrieve your academic grades from your university at the end of the academic year. Then, you will be asked to attend your coaching program at the 1st week either at 31st Jan and 1st of Feb 2013 for (How to be an Ultra Super Student) or at 29 January 2013 for (Learning and Success in Health Faculties), as well as completing the questionnaires before and after the program at the 12th week of the 1st semester, 1st, 2nd, and 5th weeks of the 2nd semester as hard copy forms. An announcement by Umm Al-Qura University email system will remind you and inform you with the exact date and location to do that before a week from each questionnaire time.

You cannot attend any program unless you signed and agreed on all condition in this consent. If you agree to participate you do have to sign below and give it to the research team and keep a copy with you.

**EXPECTED BENEFITS**

It is expected that this program will directly benefit you as it is expected to gain knowledge to improve your academic performance and wellbeing.

In regards to the community and the University, the outcome of this project will provide insight information about the effect of the coaching program to improve participants' psychological status and academic performance. In addition, such program might be used later on in the University in case of positive outcomes.
To recognize your contribution to the research, participants to attend the program is completely free (worth 260-360 SR usually) and you will also receive a certificate of attendance from Queensland University of Technology signed by the co-ach, Dr Janet Hon from School of Public Health and Social Work, and Dr Ebne Strod from School of Psychology and Counselling.

RISKS
There is a potential risk that you will feel emotional discomfort or fatigue. If you feel any type of emotional discomfort, you may withdraw from the study at any point verbally by advise the program leader that you wish to withdraw, or simply by leaving the session. If you decide to withdraw, any identifiable data that we have about you will be destroyed and not to be used. Your non-identifiable data might be used in this study or further study (such as the anonymous questionnaires data).

In addition, if you become distressed during the study as a result of the activities involved in the project, you can also receive professional psychological counselling from the Centre of Student Advising at Umm Al-Qura University by applying electronically on the main website of Umm Al-Qura University.

If you feel fatigued during the programs, you can leave the program for a cup of tea, coffee or juices any point. There will be multiple breaks for snacks and short exercises for 1-2 minutes during the program.

PRIVACY AND CONFIDENTIALITY
All comments and responses are anonymous and will be treated confidentially. Please note that non-identifiable data collected in this project may be used as comparative data in future projects. Any data collected as part of this project will be stored securely as per QUT’s Management of research data policy.

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 any further information please contact one of the research team members below.

<table>
<thead>
<tr>
<th>Khalid Aboaldumant</th>
<th>Janet Hon</th>
<th>Ebne Strod</th>
</tr>
</thead>
<tbody>
<tr>
<td>+61 459 071 154</td>
<td>+61 7 3138 5596</td>
<td>+61 7 3138 8416</td>
</tr>
<tr>
<td><a href="mailto:khalid.aboaldumant@student.qut.edu.au">khalid.aboaldumant@student.qut.edu.au</a></td>
<td><a href="mailto:x.hou@qut.edu.au">x.hou@qut.edu.au</a></td>
<td><a href="mailto:e.strod@qut.edu.au">e.strod@qut.edu.au</a></td>
</tr>
</tbody>
</table>

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 +61 7 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.
Appendix C: Consent form for the main study (Arabic version)
استخدمت في المستكيل في دراسات أخرى كل البيانات التي سيتم جمعها في خلال هذا المشروع سيتم حفظها بآمان تحت أنظمة إدارة البيانات المثلية في جامعة كونستانت غولد للتقنية.

تحذر من أن أي نشر أو نقل (إعادة الموافقة)المطبعة لتأكيد موافقة على المشاركة في البحوث غير المسموح.

إن كانت لديك استفسارات أخرى، ترجى التواصل مع أحد أعضاء الفريق البحثي أثناء هذه الأسابيع، ويمكن الاتصال بهم بالرقم:

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للشكاوى عن هذا البحث، جامعة كونستانت غولد للتقنية مسؤولة عن البحث واتخاذ قرارات وتكاليف البحث. يمكن أن تكون بناءً على إشارة عالمية. إذا كنت تود المشاركة، يرجى إرفاق诗 EthicsTeam@qut.edu.au.

فقط: تأكد من عدم قراءة هذه التعليمات في هذا المشروع البحثي. شكرا للتعاون في هذه الورقة لمعلوماتكم.
تأثير برنامج التنمية البشرية التدريبي على الصحة النفسية والأداء الأكاديمي لطلاب طب الأسنان والطب البشري في المملكة العربية السعودية

رقم موافقة وحدة الأخلاق جامعة كويرنلاند للتكنولوجيا: 110000004114

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الإفراح بالموافقة على الإفادة

بوجدة بالإنسانية، فقد كتب بذلك: 
• يجب تجاهل بعض المعلومات الموجودة في المستند بخصوص البرنامج.
• يجب تجاهل بعض المعلومات الموجودة في الإطار الأساسي.
• قد يكون ذلك مناسبًا إذا تم إعلامه بوجود أي ضرر قد تواجهه.
• توصي بأن يكون في الإطار الأساسي من أي وجه من الدراسة بدون أي طريقة أو عناصر.
• توضيح أن تطبيق أي عمليات إختيارات إجراء المشاريع.
• توضيح أن يمكن إجراء أي عمليات إختيارات إجراء المشاريع.
• توضيح أن يمكن إجراء أي عمليات إختيارات إجراء المشاريع.
• توضيح أن يمكن إجراء أي عمليات إختيارات إجراء المشاريع.

إذا كنت توافق، أطلب إشارة صبي في البريد التالي:

أكتب الآل تتخي إله للبرنامج المطلبي بذكر نسخة من كل الأفكار الخاصة بك من حسابك في نهاية السنة الأكاديمية.

الاسم:  
التاريخ:  
التوقع:  

من فضلك، فم بإعداد هذه النسخة إلى الفريق البشري، احتفظ بنسخة معاً (يمكنك أخذ نسخة من إفراح الموافقة من الفريق البشري).
Appendix D: Consent form for the pilot study (English version)

Appendices 235
RISKS
There is a potential risk that you will feel emotional discomfort or fatigue. If you feel any type of emotional discomfort, you may withdraw from the study at any point verbally by advising the program leader that you wish to withdraw, or simply by leaving the session. If you decide to withdraw, any identifiable data that we have about you will be destroyed and not to be used. Your non-identifiable data might be used in this study or further study (such as the anonymous questionnaires data).

In addition, if you become distressed during the study as a result of the activities involved in the project, you can also receive professional psychological counselling from the Centre of Student Advising at Umm Al-Qura University by applying electronically on the main website of Umm Al-Qura University.

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PRIVACY AND CONFIDENTIALITY
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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 any further information please contact one of the research team members below.

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Thank you for helping with this research project. Please keep this sheet for your information.
CONSENT FORM FOR QUT RESEARCH PROJECT

The Effect of a Self-Development Coaching Program on Psychological Health and Academic Performance Among Dental and Medical Students in Saudi Arabia

QUT Ethics Approval Number 1200000411

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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 +61 7 3138 5123 or email ethicscontact@qut.edu.au if you have concerns about the ethical conduct of the project.
- Understand that non-identifiable data collected in this project may be used as comparative data in future projects.
- Agree to participate in the project.

If you agree please tick the box below:

☐ Understand that you are giving permission to the research team to retrieve your academic grades from your university at the end of the academic year.

Name ____________________________________________________________

Signature _________________________________________________________

Date _____________________________________________________________

Please give this Copy to the Research team, and Keep a Copy With You.

(You can take a copy of this consent from the research team).
Appendix E: Consent form for the pilot study (Arabic version)
للمشاركة في هذا البحث، يُرجى التواصل مع:

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إذا كنت ترغب في طلب الانضمام أو استفسار آخر، يرجى التواصل مع أحد أعضاء الفريق البحث لناء.

إذا كنت ترغب في طلب الانضمام أو استفسار آخر، يرجى التواصل مع أحد أعضاء الفريق البحث لناء.

شكرًا لمساعدتكم في هذا المشروع البحثي. يُرجى احتفظ بهذه الوثيقة لمعلوماتكم.
تأثير برنامج التربية البدنية على الصحة النفسية والأداء الأكاديمي لطلاب طب الأسنان والطب البشري في المملكة العربية السعودية

الإفلاضات مع أفراد البحث العلمي

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الإفلاضات للموافقة على الإفلاضات

الخيار

- لا
- دSIDE

إذا كنت تعتقد أن الفرق العلمي في المشرف الفردي، فأخبر علامة رقمي نتائج نتائج في نهاية السنة الأكاديمية.

الاسم

الموضوع

التاريخ

من فضلك، قم بإعداد هذه النسخة إلى الفريق البحثي، واحتفظ بنسخة معك (يمكنك اخذ نسخة من إفادية الموافقة على الفريق البحثي)
Appendix F: Booklet covers given to students at the intervention

Note: the first picture is for the “How to Be an Ultra Super Student” program, and the second one is for “Learning and Success in Health Faculties”.
Appendix G: Supplemental CDs – covers given to students at the intervention

Note: the first picture is for the “How to Be an Ultra Super Student” program, and the second one is for “Learning and Success in Health Faculties”.

ال تقنيات السرية للتفوق الدراسي
كيف تصبح دافورة
د. خالد أبو الشامات

التعلم والنجاح في الكليات الطبية
د. خالد أبو الشامات
Appendix H: Questionnaire translation versions
Translation v.2
Forward translation by the accredited translator.

SWLS
DIRECTIONS: Below are five statements with which you may agree or disagree. Using the 1 to 7 scale below, indicate your agreement with each item by placing the appropriate number in the space preceding that item. Please be open and honest in your responding.
1 = Strongly Disagree
2 = Disagree
3 = Slightly Disagree
4 = Neutral Agree or Disagree
5 = Slightly Agree
6 = Agree
7 = Strongly Agree

1. In most ways my life is close to my ideal.
2. The conditions of my life are excellent.
3. I am satisfied with my life.
4. So far I have gotten the important things I want in my life.
5. If I could live my life over, I would

Coach and coaching program characteristics:

Please read each statement and choose a rating from (1 to 10), as (1) indicates the lowest rating, and (10) indicates the highest rating. Do not spend too much time on any statement. These answers will be completely confidential and will not affect your relation with the coach.

1. The coach empathy level with audience.
2. The coach persuasion level.
3. The coach's confidence level.
4. The coach used personal experiences in the course.
5. The coach motivation level.
6. The coach abilities to influence emotions.
7. The coach was a role model for the course content.
8. The coach abilities to draw your attention.
9. What is the level of experience you have in the course content?
10. What is the level of satisfaction did you have within the program?
11. What is the level of relevance of this program to you?

Accuracy and Completeness:

We would like to indicate below how much you believe, right now, that the therapy you are receiving will help to reduce your anxiety. Belief usually has two aspects: (1) what one thinks will happen and (2) what one feels will happen. Sometimes these are similar; sometimes they are different. Please answer the questions below. In the first set, answer in terms of what you think: In the second set, answer in terms of what you really and truly feel. We do not want your therapist to ever see these ratings, so please keep the sheet covered when you are done.

Set 1: At this point, how logical does the therapy offered to you seem?
1 = not at all logical 2 = Logical somewhat 3 = Very logical

Set 2: At this point, how successfully do you think this treatment will be in reducing your anxiety symptoms?
1 = not at all useful 2 = Useful somewhat 3 = Very useful

How confident would you be in recommending this treatment to a friend who experiences similar problems?
1 = not at all confident 2 = Confident somewhat 3 = Very confident

By the end of the therapy period, how much improvement in your anxiety symptoms do you think will occur?
1 = 0% 2 = 10% 3 = 20% 4 = 30% 5 = 40% 6 = 50% 7 = 60% 8 = 70% 9 = 80% 10 = 90% 11 = 100%

Set 1: For this set, close your eyes for a few moments, and try to identify what you really feel about the therapy and its likely success. Then answer the following questions.

At this point, how much do you really feel that therapy will help you to reduce your anxiety symptoms?
1 = not at all 2 = somewhat 3 = very much

By the end of the therapy period, how much improvement in your anxiety symptoms do you really feel will occur?
1 = 0% 2 = 10% 3 = 20% 4 = 30% 5 = 40% 6 = 50% 7 = 60% 8 = 70% 9 = 80% 10 = 90% 11 = 100%

Note: This is a self-report measure; full inclusiveness of the emotions is not guaranteed.
### Part 3: The Satisfaction with Life Scale

**English**

*Please rate your agreement with each of the following statements:* 1 = Strongly Disagree, 2 = Disagree, 3 = Slightly Disagree, 4 = Neither Agree or Disagree, 5 = Slightly Agree, 6 = Agree.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall, how satisfied am I with my life?</td>
<td></td>
</tr>
<tr>
<td>How often have you felt that life is going well?</td>
<td></td>
</tr>
<tr>
<td>How often have you felt that life is going very well?</td>
<td></td>
</tr>
<tr>
<td>How often have you felt that life is going badly?</td>
<td></td>
</tr>
<tr>
<td>How often have you felt that life is going very badly?</td>
<td></td>
</tr>
<tr>
<td>How satisfied am I with the nature of my life?</td>
<td></td>
</tr>
<tr>
<td>How satisfied am I with the way things are going in my life?</td>
<td></td>
</tr>
<tr>
<td>How satisfied am I with the way things are going in my life?</td>
<td></td>
</tr>
<tr>
<td>Overall, how satisfied am I with my life?</td>
<td></td>
</tr>
<tr>
<td>Overall, how satisfied am I with my life?</td>
<td></td>
</tr>
</tbody>
</table>

**Arabic**

*Please rate your agreement with each of the following statements:* 1 = شديد الاقتراح، 2 = اقتراح، 3 = سlight اقتراح، 4 = معتدلة، 5 = شديد التأكيد، 6 = أقوى التأكيد.

<table>
<thead>
<tr>
<th>السؤال</th>
<th>الرد</th>
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<tbody>
<tr>
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<tr>
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### Appendices

**Coach and coaching program characteristics:**

Please read each statement and choose a rating from 1 to 5, as (3) indicates the lowest rating, and (5) indicates the highest rating. Do not spend too much time on any statement. These answers will be completely confidential and will not affect your relation with the coach.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Rating</th>
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</thead>
<tbody>
<tr>
<td>The coach shows empathy with the client.</td>
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<tr>
<td>The coach has good interpersonal skills.</td>
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<tr>
<td>The coach is well organized and has good planning skills.</td>
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<tr>
<td>The coach uses effective feedback.</td>
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<tr>
<td>The coach is able to manage group dynamics effectively.</td>
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<tr>
<td>The coach provides clear and concise feedback.</td>
<td></td>
</tr>
<tr>
<td>The coach listens actively and provides constructive feedback.</td>
<td></td>
</tr>
<tr>
<td>The coach is able to provide practical solutions.</td>
<td></td>
</tr>
<tr>
<td>The coach is able to handle difficult situations.</td>
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<tr>
<td>The coach is able to handle ethical dilemmas.</td>
<td></td>
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<tr>
<td>The coach is able to handle client resistance.</td>
<td></td>
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<tr>
<td>The coach is able to handle client change of focus.</td>
<td></td>
</tr>
<tr>
<td>The coach is able to handle client interpersonal conflicts.</td>
<td></td>
</tr>
<tr>
<td>The coach is able to handle client emotional issues.</td>
<td></td>
</tr>
<tr>
<td>The coach is able to handle client resistance to feedback.</td>
<td></td>
</tr>
<tr>
<td>The coach is able to handle client resistance to change of focus.</td>
<td></td>
</tr>
</tbody>
</table>

**Therapy evaluation form:**

We would like you to indicate below how much you believe, right now, that the therapy you are receiving will help reduce your anxiety. Please rate each statement on a scale from 1 to 5.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>The therapy is effective in reducing my anxiety.</td>
<td></td>
</tr>
<tr>
<td>The therapy is helping me cope with my anxiety.</td>
<td></td>
</tr>
<tr>
<td>The therapy is helping me manage my thoughts and behaviors.</td>
<td></td>
</tr>
<tr>
<td>The therapy is helping me learn new skills.</td>
<td></td>
</tr>
<tr>
<td>The therapy is helping me develop a new perspective.</td>
<td></td>
</tr>
<tr>
<td>The therapy is helping me develop a new way of thinking.</td>
<td></td>
</tr>
<tr>
<td>The therapy is helping me feel more in control of my anxiety.</td>
<td></td>
</tr>
<tr>
<td>The therapy is helping me feel more in control of my thoughts and feelings</td>
<td></td>
</tr>
<tr>
<td>The therapy is helping me feel more in control of my behaviors.</td>
<td></td>
</tr>
<tr>
<td>The therapy is helping me feel more in control of my emotions.</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

- Please keep all your ratings in the range of 1 to 5.
- Please answer all the questions honestly, even if you feel uncomfortable.
- Your responses will be kept confidential and will not affect your relationship with the coach.
Translation v.4
Version of expert panel

The Satisfaction with Life Scale

The Satisfaction with Life Scale is a self-report measure that consists of five statements with which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each item by placing the appropriate number in the line preceding that item. Please be open and honest in your responding.

1 = Strongly Disagree
2 = Disagree
3 = Slightly Disagree
4 = Neither Agree nor Disagree
5 = Slightly Agree
6 = Agree
7 = Strongly Agree

1. I am satisfied with life.
2. The conditions of my life are excellent.
3. I amatisfied with life.
4. So far I have gotten the important things I want in life.
5. I could give up my life over. I would change almost nothing.

Part 2: Demographic Information

Gender: Male Female
Year: 1st 2nd 3rd
University and school: Nationality:
UOW medical student: Nationality:
Marital status: Family monthly income:
Single Married Widowed
Less than 5000 5000-10000 More than 10000

Coach and coaching program characteristics:

Please read each statement and choose a rating from 1 to 10, as indicated on the lowest rating, and (10) indicates the highest rating. Do not spend too much time on any statement. These answers will be completely confidential and will not affect your relationship with the coach.

1. The coach empathy level with audience.
2. The coach perception level.
3. The coach confidence level.
4. The coach used his personal experiences in the course.
5. The coach motivation level.
6. The coach abilities to influence emotions.
7. The coach was a role model for the course content.
8. The coach abilities to draw your attention.

9. What is the level of experience you have in the course content?
10. What is the level of satisfaction you have within the program?
11. What is the level of relevance of this program to you?

Therapy evaluation form

We would like you to indicate below how much you believe, right now, that the therapy you are receiving will help to reduce your anxiety. Believe usually has two aspects to it: (1) what one thinks will happen and (2) what one feels will happen. Sometimes these are similar, sometimes they are different. Please answer the questions below. In the first set, answer in terms of what you think. In the second set answer in terms of what you really and truly feel. We do not want your therapist to ever see these ratings, so please keep the sheet covered when you are done.

Set I:
1. At this point, how logical does the therapy offered to you seem?
   not at all logical Logical somewhat very logical
   1 2 3 4 5 6 7 8 9
2. At this point, how successfully do you think this treatment will be in reducing your symptoms?
   not at all useful Useful somewhat very useful
   1 2 3 4 5 6 7 8 9
3. How confident would you be in recommending this treatment to a friend who experiences similar problems?
   not at all confident confident somewhat very confident
   1 2 3 4 5 6 7 8 9
4. By the end of the therapy period, how much improvement in your symptoms do you think will occur?
   0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Set II:
For this set, close your eyes for a few moments, and try to identify what you really feel about the therapy and in likely success. Then answer the following question:
1. At this point, how much do you really feel that therapy will help you to reduce your symptoms?
   not at all somewhat very much
   1 2 3 4 5 6 7 8 9
2. By the end of the therapy period, how much improvement in your symptoms do you really feel will occur?
   0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

% 100% 90% 80% 70% 60% 50% 40% 30% 20% 10% 0%
### Section 3: Life Satisfaction

Please rate each item from 1-7 based on the following scale. When answering please try to be fully honest and truthful.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Slightly disagree</th>
<th>Neither disagree nor agree</th>
<th>Slightly agree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

- Please Rate
- In general, I have achieved my ideal life.
- My life conditions are excellent.
- I am satisfied with my life.
- Up to this point I have achieved the things that I want for my life.
- If I could live my life again, I would not change anything.

### Section 4: Your impression about the trainer

Please rate the following statements and rate from 1-10 using this scale: 1 as the lowest evaluation rate and 10 the highest evaluation rate. Do not take a long time to answer. All answers will be confidential and will not affect your relationship with the coach in any ways.

#### Questions

1. How would you rate your level of satisfaction with the program?
2. To what extent do you think the content of this program is relevant to your life?
3. To what extent do you think the coach was able to capture your attention during the program?
4. How confident was the coach?
5. How would you rate the coach’s ability to use and apply the content of this program in his own life?
6. To what extent are you familiar with the program’s content from previous experiences?
7. How persuasive was the coach?
8. How motivated was the coach during the program?
9. What is your assessment of the coach’s ability to influence your emotions?
10. How effective was the coach in demonstrating sympathy and understanding to the audience (since he went through the same experiences and feelings)?
11. To what extent do you think the coach has used his own personal experience to illustrate the content of the program?

### Section 5: Predictability and credibility assessment

The following questions are to assess how much you think that the program you are currently receiving will help to improve your mental health and academic level in two ways: first, in what you logically think (with your mind) will happen, and the second, what you feel (with your emotions) will happen. Those ways could match or differ from each other, so please answer the following questions.

In the first group, please answer the following questions based on what you logically think (with your mind).

**First group:**
- At this stage, to what extent do you consider that the program you are receiving is realistic?

<table>
<thead>
<tr>
<th>Strongly unrealistic</th>
<th>Unrealistic</th>
<th>Somewhat realistic</th>
<th>Very realistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

- At this stage, to what degree do you think (with your mind) that the program is successfully helping you to improve your mental health and academic level?

<table>
<thead>
<tr>
<th>Strongly unsuccessful</th>
<th>Unsuccessful</th>
<th>Somewhat successful</th>
<th>Very successful</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

- At this stage, how confident would you be recommending this program to a friend who is in a similar situation?

<table>
<thead>
<tr>
<th>Strongly not confident</th>
<th>Not confident</th>
<th>Somewhat confident</th>
<th>Very confident</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

- At the end of this program, what is the level of improvement you think (with your mind) that you will achieve with regards to your mental health and academic level?

<table>
<thead>
<tr>
<th>Very low</th>
<th>Low</th>
<th>Moderate</th>
<th>High</th>
<th>Very high</th>
</tr>
</thead>
<tbody>
<tr>
<td>%100</td>
<td>%90</td>
<td>%80</td>
<td>%70</td>
<td>%60</td>
</tr>
</tbody>
</table>

**Second group:**
In this group please close your eyes for a few minutes, and try to identify how you feel with respect to the program and the likelihood of its success, and then answer the following questions.

5. At this stage, what is the degree you feel (with your emotions) that the program is successfully helping you to improve your mental health and academic level?

<table>
<thead>
<tr>
<th>Strongly unsuccessful</th>
<th>Unsuccessful</th>
<th>Somewhat successful</th>
<th>Very successful</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

6. At the end of this program, what is the level of improvement you feel (with your emotions) that you will achieve with regards to your mental health and academic level?

<table>
<thead>
<tr>
<th>Very low</th>
<th>Low</th>
<th>Moderate</th>
<th>High</th>
<th>Very high</th>
</tr>
</thead>
<tbody>
<tr>
<td>%100</td>
<td>%90</td>
<td>%80</td>
<td>%70</td>
<td>%60</td>
</tr>
</tbody>
</table>
Section 3: Enjoying Life

Read the following statements. Rate each statement from 1 to 7 according to the criteria below. Please be honest.

Strongly disagree | Disagree | Moderately disagree | Neither agree nor disagree | Moderately agree | Agree | Strongly agree

1 2 3 4 5 6 7

Statement
Basically my life looks like the ideal life I look for
My life is excellent
I am satisfied with my life
I have got till now all the important things I want in life
If I had the chance to live again I would change nothing.

Section 5: Your impression about the trainer

Please read each statement. Rate from 1 to 10 where 1 for the least and 10 for the most. Do not spend too much time to answer. Each answer will be confidentially and will influence your relationship with the trainer.

Question 1-10
1 How do you evaluate your satisfaction with the course?
2 How much do you think the course is related to your life?
3 How much do you think the trainer attracted you attention during the programs?
4 How do you evaluate the trainer’s confidence?
5 How much do you think that the trainer was a real mentor for applying the course material?
6 How much do you think you have applied what you learned as the course progressed?
7 How do you evaluate the trainer’s ability to persuade?
8 How do you evaluate the trainer’s ability to motivate?
9 How do you evaluate the trainer’s ability to influence your emotions?
10 How do you rate the trainer’s empathy for the audience (by having the same experience)?
11 How much do you think the trainer used his/her personal experience?

Section 6: Credibility & Expectation Evaluation

The following questions are aimed to evaluate how much you think that the program is helping you to improve your mental health & academic performance in tow aspects: what you think logically will happen and what you feel will happen. They could be the same or be different.

So please answer the following questions.
In group answer based on what you think logically.

Group 1:
1. At this stage, how much do you think the program is reasonable so far?

Absolutely unreasonable | Pretty reasonable | Extremely reasonable
1 2 3 4 5 6 7 8 9

2. At this stage, how successful do you think (logically) the program is helping you to improve your mental health & academic performance?

Not Useful | Pretty useful | Extremely Useful
1 2 3 4 5 6 7 8 9

3. How confident are you to recommend a friend or someone who has the same situation?

No confident | Somewhat confident | Extremely confident
1 2 3 4 5 6 7 8 9

4. At the end of this program, how much improvement in your mental health & academic performance do you think (logically) would happen?

% 100 | %90 | %80 | %70 | %60 | %50 | %40 | %30 | %20 | %10 | %0

Group 2:
In this group close your eyes for a few minutes and try to know what you really feel about the program and how successful it would be. Then answer the following questions.
5. At this stage, how successful do you feel that the program has helped you to improving your mental health & academic performance so far?

Very much | Much | Not at all
1 2 3 4 5 6 7 8 9

6. In the end of the program, how much improvement do you think would happen to your mental health & academic performance?

% 100 | %90 | %80 | %70 | %60 | %50 | %40 | %30 | %20 | %10 | %0
### تفسير النتيجة

**الإجمالي**

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<td>لا تكون ادارة إذا أعطت هذه القضايا ملحوظة في النهاية</td>
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**العبارات الفحصية**

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**الرد النفي**

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<tr>
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<td>لا يمكن أن يكون النفي يقوم بالإجراءات</td>
<td>لا يمكن أن يكون النفي يقوم بالإجراءات</td>
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<td>لا يمكن أن يكون النفي يقوم بالإجراءات</td>
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**التوصية**

<table>
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<tr>
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<th>7</th>
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<tbody>
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<td>في الأجل للأمانة</td>
<td>في الأجل للأمانة</td>
<td>في الأجل للأمانة</td>
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**ترجمة**

**العناصر المنشئة**

<table>
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<th>العناصر المنشئة</th>
<th>1</th>
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<tbody>
<tr>
<td>التوضيحات</td>
<td>لا تكون ادارة إذا أعطت هذه القضايا ملحوظة في النهاية</td>
<td>لا تكون ادارة إذا أعطت هذه القضايا ملحوظة في النهاية</td>
<td>لا تكون ادارة إذا أعطت هذه القضايا ملحوظة في النهاية</td>
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<td>لا تكون ادارة إذا أعطت هذه القضايا ملحوظة في النهاية</td>
<td>لا تكون ادارة إذا أعطت هذه القضايا ملحوظة في النهاية</td>
</tr>
<tr>
<td>العبارة الفحصية</td>
<td>على مدار العام</td>
<td>على مدار العام</td>
<td>على مدار العام</td>
<td>على مدار العام</td>
<td>على مدار العام</td>
<td>على مدار العام</td>
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**الإرشادات**

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<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>سؤال:</td>
<td>لا تكون ادارة إذا أعطت هذه القضايا ملحوظة في النهاية</td>
<td>لا تكون ادارة إذا أعطت هذه القضايا ملحوظة في النهاية</td>
<td>لا تكون ادارة إذا أعطت هذه القضايا ملحوظة في النهاية</td>
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<td>لا تكون ادارة إذا أعطت هذه القضايا ملحوظة في النهاية</td>
<td>لا تكون ادارة إذا أعطت هذه القضايا ملحوظة في النهاية</td>
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<tr>
<td>التوصية</td>
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<td>في الأجل للأمانة</td>
<td>في الأجل للأمانة</td>
<td>في الأجل للأمانة</td>
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**قيمة النتيجة**

<table>
<thead>
<tr>
<th>قيمة النتيجة</th>
<th>100</th>
<th>90</th>
<th>80</th>
<th>70</th>
<th>60</th>
<th>50</th>
<th>40</th>
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<tbody>
<tr>
<td>النتيجة النفي</td>
<td>لا تكون ادارة إذا أعطت هذه القضايا ملحوظة في النهاية</td>
<td>لا تكون ادارة إذا أعطت هذه القضايا ملحوظة في النهاية</td>
<td>لا تكون ادارة إذا أعطت هذه القضايا ملحوظة في النهاية</td>
<td>لا تكون ادارة إذا أعطت هذه القضايا ملحوظة في النهاية</td>
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<td>لا تكون ادارة إذا أعطت هذه القضايا ملحوظة في النهاية</td>
</tr>
<tr>
<td>النتيجة المنشئة</td>
<td>في الأجل للأمانة</td>
<td>في الأجل للأمانة</td>
<td>في الأجل للأمانة</td>
<td>في الأجل للأمانة</td>
<td>في الأجل للأمانة</td>
<td>في الأجل للأمانة</td>
<td>في الأجل للأمانة</td>
</tr>
</tbody>
</table>
الترجمة الإنجليزية والسعوية

يبدو أن هناك خطأ في الترجمة. يرجى المراجعة والتأكد من الترجمة الصحيحة.

الكلمة

لا يوجد نص يمكن قراءته بشكل طبيعي. يرجى التحقق من الترجمة الإنجليزية والسعوية بشكل مفصل.

الشرح

لا يوجد نص يمكن قراءته بشكل طبيعي. يرجى التحقق من الترجمة الإنجليزية والسعوية بشكل مفصل.
Appendix I: The final English version of the questionnaire with all sections (including all the sections)

<table>
<thead>
<tr>
<th>Part 1: Depression, Anxiety, and Stress Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.</td>
</tr>
<tr>
<td>0  Did not apply to me at all</td>
</tr>
<tr>
<td>1  Applied to me to some degree, or some of the time</td>
</tr>
<tr>
<td>2  Applied to me to a considerable degree, or a good part of time</td>
</tr>
<tr>
<td>3  Applied to me very much, or most of the time</td>
</tr>
</tbody>
</table>

| 1  | I found it hard to wind down | 0 | 1 | 2 | 3 |
| 2  | I was aware of dryness of my mouth | 0 | 1 | 2 | 3 |
| 3  | I couldn't seem to experience any positive feeling at all | 0 | 1 | 2 | 3 |
| 4  | I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion) | 0 | 1 | 2 | 3 |
| 5  | I found it difficult to work up the initiative to do things | 0 | 1 | 2 | 3 |
| 6  | I tended to over-react to situations | 0 | 1 | 2 | 3 |
| 7  | I experienced trembling (e.g. in the hands) | 0 | 1 | 2 | 3 |
| 8  | I felt that I was using a lot of nervous energy | 0 | 1 | 2 | 3 |
| 9  | I was worried about situations in which I might panic and make a fool of myself | 0 | 1 | 2 | 3 |
| 10 | I felt that I had nothing to look forward to | 0 | 1 | 2 | 3 |
| 11 | I found myself getting agitated | 0 | 1 | 2 | 3 |
| 12 | I found it difficult to relax | 0 | 1 | 2 | 3 |
| 13 | I felt down-hearted and blue | 0 | 1 | 2 | 3 |
| 14 | I was intolerant of anything that kept me from getting on with what I was doing | 0 | 1 | 2 | 3 |
| 15 | I felt I was close to panic | 0 | 1 | 2 | 3 |
| 16 | I was unable to become enthusiastic about anything | 0 | 1 | 2 | 3 |
| 17 | I felt I wasn't worth much as a person | 0 | 1 | 2 | 3 |
| 18 | I felt that I was rather touchy | 0 | 1 | 2 | 3 |
| 19 | I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat) | 0 | 1 | 2 | 3 |
| 20 | I felt scared without any good reason | 0 | 1 | 2 | 3 |
| 21 | I felt that life was meaningless | 0 | 1 | 2 | 3 |

<table>
<thead>
<tr>
<th>Part 2: General Self-Efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please read each statement and select the most appropriate number, where:</td>
</tr>
<tr>
<td>1 = Not at all true</td>
</tr>
<tr>
<td>2 = Hardly true</td>
</tr>
<tr>
<td>3 = Moderately true</td>
</tr>
<tr>
<td>4 = Exactly true</td>
</tr>
</tbody>
</table>

<p>| 1  | I can always manage to solve difficult problems if I try hard enough. | 1 | 2 | 3 | 4 |
| 2  | If someone opposes me, I can find the means and ways to get what I want. | 1 | 2 | 3 | 4 |
| 3  | It is easy for me to stick to my aims and accomplish my goals. | 1 | 2 | 3 | 4 |
| 4  | I am confident that I could deal efficiently with unexpected events. | 1 | 2 | 3 | 4 |
| 5  | Thanks to my resourcefulness, I know how to handle unforeseen situations. | 1 | 2 | 3 | 4 |</p>
<table>
<thead>
<tr>
<th></th>
<th>I can solve most problems if I invest the necessary effort.</th>
<th>1 2 3 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>I can remain calm when facing difficulties because I can rely on my coping abilities.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>8</td>
<td>When I am confronted with a problem, I can usually find several solutions.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>9</td>
<td>If I am in trouble, I can usually think of a solution.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>10</td>
<td>I can usually handle whatever comes my way.</td>
<td>1 2 3 4</td>
</tr>
</tbody>
</table>

**Part 3: The Satisfaction with Life Scale**

**DIRECTIONS:** Below are five statements with which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each item by placing the appropriate number in the line preceding that item. Please be open and honest in your responding.

1 = Strongly Disagree  
2 = Disagree  
3 = Slightly Disagree  
4 = Neither Agree or Disagree  
5 = Slightly Agree  
6 = Agree  
7 = Strongly Agree  

1. In most ways my life is close to my ideal.  
2. The conditions of my life are excellent.  
3. I am satisfied with life.  
4. So far I have gotten the important things I want in life.  
5. If I could live my life over, I would change almost nothing

**Part 4: demographic information**

<table>
<thead>
<tr>
<th>The academic year</th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ 2nd year</td>
<td>☐ Male</td>
</tr>
<tr>
<td>☐ 3rd year</td>
<td>☐ Female</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>University and school</th>
<th>Nationality</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ UQU medical student</td>
<td>☐ Saudi</td>
</tr>
<tr>
<td>☐ UQU dental student</td>
<td>☐ Non-Saudi</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Marital status?</th>
<th>Family monthly income</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Single</td>
<td>☐ Less than 5000</td>
</tr>
<tr>
<td>☐ Married</td>
<td>☐ 5000-10000</td>
</tr>
<tr>
<td>☐ Divorced</td>
<td>☐ More than 10000</td>
</tr>
<tr>
<td>☐ Widowed</td>
<td></td>
</tr>
</tbody>
</table>

**Part 5: coach and coaching program characteristics:**

Please read each statement and choose a rating from (1 to 10), as (1) indicates the lowest rating, and (10) indicates the highest rating. Do not spend too much time on any statement. These answers will be completely confidential and will not affect your relation with the coach.

1. How do you evaluate your satisfaction about the program?  
2. What is the level of relevance of this program to you?  
3. To what extent do you think the coach able to draw your attention during the program?  
4. What is your evaluation about the coach's confidence to himself?
<table>
<thead>
<tr>
<th></th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>To what extent do you consider the coach as a role model for the course content?</td>
</tr>
<tr>
<td>6</td>
<td>What is the level of experience did you have in the course content?</td>
</tr>
<tr>
<td>7</td>
<td>What is your evaluation to the level of the coach in persuasion?</td>
</tr>
<tr>
<td>8</td>
<td>What is your evaluation about the level of motivation of the coach during the program?</td>
</tr>
<tr>
<td>9</td>
<td>What is your evaluation about the ability of the coach to influence upon your emotions and feelings?</td>
</tr>
<tr>
<td>10</td>
<td>What is your evaluation about the ability of the coach in his empathy and understanding feeling of the audience?</td>
</tr>
<tr>
<td>11</td>
<td>To what extent do you think, the coach used his own experiences to explain the material of the program?</td>
</tr>
</tbody>
</table>

**Part 6: Therapy evaluation form**

We would like you to indicate below how much you believe, *right now*, that the therapy you are receiving will help to reduce your anxiety. Belief usually has two aspects to it: (1) what one *thinks* will happen and (2) what one *feels* will happen. Sometimes these are similar; sometimes they are different. Please answer the questions below. In the 1st set, answer in terms of what you *think*. In the second set answer in terms of what you really and truly *feel*. We do not want your therapist to ever see these ratings, so please keep the sheet covered when you are done.

**Set I**

1. At this point, how logical does the therapy offered to you seem?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>not at all logical</td>
<td>Logical</td>
<td>somewhat</td>
<td>very logical</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. At this point, how successfully do you think this treatment will be in reducing your trauma symptoms?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>not at all useful</td>
<td>Useful</td>
<td>somewhat</td>
<td>very useful</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. How confident would you be in recommending this treatment to a friend who experiences similar problems?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>not at all confident</td>
<td>confident</td>
<td>somewhat</td>
<td>very confident</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. By the end of the therapy period, how much improvement in your trauma symptoms do you think will occur?

<table>
<thead>
<tr>
<th>0%</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
<th>40%</th>
<th>50%</th>
<th>60%</th>
<th>70%</th>
<th>80%</th>
<th>90%</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>10%</td>
<td>20%</td>
<td>30%</td>
<td>40%</td>
<td>50%</td>
<td>60%</td>
<td>70%</td>
<td>80%</td>
<td>90%</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Set II**

For this set, close your eyes for a few moments, and try to identify what you really *feel* about the therapy and its likely success. Then answer the following questions.

1. At this point, how much do you really *feel* that therapy will help you to reduce your trauma symptoms?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>not at all</td>
<td>somewhat</td>
<td>very much</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. By the end of the therapy period, how much improvement in your trauma symptoms do you really *feel* will occur?

<table>
<thead>
<tr>
<th>0%</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
<th>40%</th>
<th>50%</th>
<th>60%</th>
<th>70%</th>
<th>80%</th>
<th>90%</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>10%</td>
<td>20%</td>
<td>30%</td>
<td>40%</td>
<td>50%</td>
<td>60%</td>
<td>70%</td>
<td>80%</td>
<td>90%</td>
<td>100%</td>
</tr>
</tbody>
</table>
### Appendix J: The Arabic English version of the questionnaire with all sections (including all the sections)

<table>
<thead>
<tr>
<th>اسم</th>
<th>الجواز</th>
<th>التاريخ</th>
<th>الجزء الأول: مقياس الكانية - الفتق - التوتر</th>
</tr>
</thead>
<tbody>
<tr>
<td>كل معلومات الشخصية متعاملة بسرية، ولن تطلع أحد على الإجابات التي وضعها.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>الجزء الأول: مقياس الكانية - الفتق - التوتر</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>لا يوجد إجابات صحيحة أو خاطئة. لا تقدى وقتا طويلا في الإجابة على أي منها.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>استعمل التقديرات التالية:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>لا ينطبق على بنكنا</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ينطبق على بعض الشيء، أو قليلا من الأوقات</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ينطبق على درجة محسنة أو بعض الأوقات</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ينطبق على كثيرا جدًا، أو معظم الأوقات</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>السؤال</th>
<th>الجواب</th>
<th>الصورة</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>وجدت صعوبة في الاسترخاء والإراحة</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>شعرت بجفاف في حقي</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>لم يبدو لي أن بإمكاننا الإحساس بشاعر إيجابية على الإطلاق</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>شعرت بصعوبة في النَّفَس (شدة التنفس السريع، القلقان بدون القيام بمجهود جسدي مثلًا)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>وجدت صعوبة في أخذ المادرة معل الإشياء</td>
<td></td>
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<tr>
<td>6</td>
<td>كنت أميل إلى ردة فعل مفرطة للظروف والأحداث</td>
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<tr>
<td>7</td>
<td>شعرت برجفة (الدبيب مثلًا)</td>
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<tr>
<td>8</td>
<td>شعرت بأنني استهلك الكثير في الطاقة العصبية (شعور بأنني استهلك الكثير من قدرتي على تحمل التوتر العصبي)</td>
<td></td>
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<tr>
<td>9</td>
<td>كنت خائفًا من مواقف قد أفقد فيها السيطرة على أعصابي، واسب إجراء تنفسى</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>شعرت بأن ليس لدي أي شيء أطلع إليه</td>
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</tr>
<tr>
<td>11</td>
<td>شعرت بأنني مضطرب ومزعج</td>
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<tr>
<td>12</td>
<td>وجدت صعوبة في الاسترخاء</td>
<td></td>
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<tr>
<td>13</td>
<td>شعرت بالحزن والغم</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>لم استطع تحمل أي شيء بحول بيني وبين ما أرغب في القيام به</td>
<td></td>
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<tr>
<td>15</td>
<td>شعرت بأنني لا أرى الفوق في حالة من الرعب المافخي بدون سبب</td>
<td></td>
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<tr>
<td>16</td>
<td>فقدت الشعور بالحماس لأي شيء</td>
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<tr>
<td>17</td>
<td>شعرت بأنني قلبي كشحص</td>
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<td>18</td>
<td>شعرت بأنني أميل إلى الغيظ بسرعة</td>
<td></td>
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<tr>
<td>19</td>
<td>شعرت بضربات قلب بدون مجهود جسدي (زيادة في معدل القلب، أو غياب قلب مثلًا)</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>شعرت بالخوف بدون أي سبب وحده</td>
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<tr>
<td>21</td>
<td>شعرت بأن الحياة ليس لها معنى</td>
<td></td>
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</tbody>
</table>
الالجزء الثالث: الاستمتاع بالحياة:
تُرجو ملئ قراءة العبارات التالية، وأن تقوم بتقييم كل عبارة من 1 إلى 7 باستخدام القياس الموضح أدناه، متنحباً على درجات الصفاق والآفة.

| لا أتفق ولا أختلف | أعد نظر | أختلف قليلاً | أختلف بشدة | أتفق قليلاً | أتفق
|----|----|----|----|----|---|
|   | 1 | 2 | 3 | 4 | 5 | 6 | 7

الجملة

بشكل عام، تبدو الحياة التي أعشها قريبة من الحياة المثالية في نظرتي، أوضاعي حياتي ممتازة، أنا راضٍ عن حياتي، حتى الآن حصلت على الأشياء المهمة التي ارادتها في الحياة.

ý

الجزء الرابع: البيانات démographique:

الجنس:

السنة الميلادية
ذكر
أنثى
الجنسية
السعودية
غير سعودي
الجامعة والمناصب
جامع الام القرى كلية الطب الأسنان
جامع الأزهر كلية الطب البشري
الحياة الاجتماعية
دخل الأسرة الشهري بالربيع
قل من 5000
بين 5000-10000
أكثر من 10000
عزاب/زواج
زواج مزروع
زوجة مشتركة
أرملة

الجزء الخامس: ملاحظات عن المدرب
الفصلة: فصل النجاح التالية، يتم قرار قري 1-10، حيث أن 1 لكل تقييم، و10 يعني أعلى تقييم. لا تأخير وقفاً طولياً في الإجابة. كل الإجابة سوف تعتمد بسرية، ولن تؤثر بأي طريقة على علاقاتك مع المدرب.

<table>
<thead>
<tr>
<th>السؤال</th>
<th>قيمة من 1-10</th>
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<tbody>
<tr>
<td>كيف تقيم مستوى رضاك عن البرنامج؟</td>
<td>1</td>
</tr>
<tr>
<td>لا يمكنني تحديد هذا البرنامج مرتبط ومثالي بحثي؟</td>
<td>2</td>
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<tr>
<td>لا يمكنني تحديد أن المدرب استخدام أن يحتوي على اتصالات خلال البرنامج؟</td>
<td>3</td>
</tr>
</tbody>
</table>
الجزء الأول: تقييم التوقع والمصداقية

الإجابة الثانية تهدف لقياس مدى ابتكارات في الوقت الحالي، فإن البرنامج الذي تتلقاه يساعد في تحسين صحتك النفسية ومستواك الأكاديمي من وجهتين: الأول: ما تعتمد (فعلك) أنه سيحدث، والثاني: ما تشعر (باحساسك) أنه سيحدث. وقد يتشابهان أو يختلفان.

1. في هذه المرحلة، إلى أي مدى تعتبر البرنامج المقدم إلكن منطقيًا؟

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2. في هذه المرحلة، ما هي درجة ارتباطك (فعلك) بنجاح البرنامج في مساعدتك على تحسين صحتك النفسية ومستواك الأكاديمي؟

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3. ما مدى تفكك أن تقوم بوصول من هذه البرنامج إلى أي الأدبيات الذي له نفس وضعك الحالي؟

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4. في نهاية هذا البرنامج، ما هو مدى التحسين الذي تعتقد (فعلك) أنه قد يحدث في صحتك النفسية ومستواك الأكاديمي؟

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المجموعة الثانية:

في هذه المجموعة أعطيت للإجابة على ما تشعر به في حقيقة الأمر فيما يتعلق بالبرنامج ومدى احتمالية أنوره، ثم أحنج على الإجابة الثانية: في هذه المرحلة، ما هي درجة تشعر (باحساسك) بنجاح البرنامج في مساعدتك على تحسين صحتك النفسية ومستواك الأكاديمي؟

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5. في نهاية هذا البرنامج، ما هو مدى التحسين الذي تشعر (باحساسك) أنه قد يحدث في صحتك النفسية ومستواك الأكاديمي؟

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هم

من فضلك تأكد أنك قد أتمت الإجابة على كل الأسئلة

شكراً لك

256
Appendix K: The main study roll-up invitation design.
Appendix L: The main study invitation flyer.
Appendix M: The main study map for the intervention location.
Appendix N: Approval letter from Medical faculty, Umm Al-Qura University
Appendix O: Approval letter from Dental faculty, Umm Al-Qura University.

Kingdom of Saudi Arabia
Ministry Of Higher Education
Umm Al-Qura University

سلامه الله
doktor / Halal al-Abulshamats
 السلام عليكم ورحمة الله وبركاته،

اشتراة إلى خطابكم المرسل إلى كلية طب الأسنان بجامعة أم القرى، والمتمتمن طلباً
لإجراء دراسة على طلاب كلية طب الأسنان، فقد أبلغناكم بأنه لا مانع لدينا من إجراء الدراسة
على الطلاب والطالبات التي تساعدكم على إتمام دراستكم وبحكم المعونون بد (تأثير دورات
التنمية البشرية في أداء طلاب طب الأسنان والطب البشري وصحتهم النفسية).

ويمكنكم تقديم هذا الخطاب إلى الجهات المعنية لتقدم ما يلزم تسهيل إجراء هذه
المقابلات

د. محمد بياري
عميد كلية طب الأسنان
جامعة القرى

ش: 847
تاريخ: 18/4/1432

Appendices 261
Appendix P: Approval letter from Umm al-Qura Charity Society Women to run the pilot study
Appendix Q: Approval letter from King Abdullah Medical City to run the main study
Appendix R: QUT ethical approval

University Human Research Ethics Committee
HUMAN ETHICS APPROVAL CERTIFICATE
NHMRC Registered Committee Number EC00171

Date of Issue: 25/8/14 (supersedes all previously issued certificates)

Dear Mr Khalid Aboalshamat

This Approval Certificate serves as your written notice that the proposal has met the requirements of the National Statement on Ethical Conduct in Human Research and has been approved on that basis. You are therefore authorised to commence activities as outlined in your proposal application, subject to any specific and standard conditions detailed in this document.

Project Details

Category of Approval: Human Negligible-Low Risk
Approved From: 6/09/2012   Approved Until: 6/09/2015 (subject to annual reports)
Approval Number: 120000411
Project Title: The effect of a self-development coaching program on psychological health and academic performance among dental and medical students in Saudi Arabia

Investigator Details

Chief Investigator: Mr Khalid Aboalshamat
Other Staff/Students:
Investigator Name   Type    Role
Dr Janet Hou        Internal  Supervisor
Dr Esben Strood     Internal  Supervisor

Conditions of Approval

Specific Conditions of Approval:
None apply

Standard Conditions of Approval:
The University’s standard conditions of approval require the research team to:

1. Conduct the project in accordance with University policy, NHMRC / AVCC guidelines and regulations, and the provisions of any relevant State / Territory or Commonwealth regulations or legislation;

2. Respond to the requests and instructions of the University Human Research Ethics Committee (UHREC);

3. Advise the Research Ethics Coordinator immediately if any complaints are made, or expressions of concern are raised, in relation to the project;

4. Suspend or modify the project if the risks to participants are found to be disproportionate to the benefits, and immediately advise the Research Ethics Coordinator of this action;

5. Stop any involvement of any participant if continuation of the research may be harmful to that person, and immediately advise the Research Ethics Coordinator of this action;

6. Advise the Research Ethics Coordinator of any unforeseen development or events that might affect the continued ethical acceptability of the project;

7. Report on the progress of the approved project at least annually, or at intervals determined by the Committee;

8. (Where the research is publicly or privately funded) publish the results of the project in such a way as to permit scrutiny and contribute to public knowledge; and
9. Ensure that the results of the research are made available to the participants.

Modifying your Ethical Clearance:
Requests for variations must be made via submission of a Request for Variation to Existing Clearance Form (http://www.research.qut.edu.au/ethics/forms/hum/vari/var.jsp) to the Research Ethics Coordinator. Minor changes will be assessed on a case by case basis.

It generally takes 7-14 days to process and notify the Chief Investigator of the outcome of a request for a variation.

Major changes, depending upon the nature of your request, may require submission of a new application.

Audits:
All active ethical clearances are subject to random audit by the UHREC, which will include the review of the signed consent forms for participants, whether any modifications / variations to the project have been approved, and the data storage arrangements.

Further information regarding your ongoing obligations regarding human based research can be found via the Research Ethics website http://www.research.qut.edu.au/ethics/ or by contacting the Research Ethics Coordinator on 07 3138 2091 or ethicscontact@qut.edu.au.

If any details within this Approval Certificate are incorrect please advise the Research Ethics Unit within 10 days of receipt of this certificate.
## Appendix S: ANZCTR registration

<table>
<thead>
<tr>
<th>Request Number:</th>
<th>366518</th>
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<tbody>
<tr>
<td>Current Page:</td>
<td>Review</td>
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</table>

**Trial from ANZCTR**

<table>
<thead>
<tr>
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<th>ACTRN12614000896673</th>
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<tbody>
<tr>
<td>Trial Status</td>
<td>Registered</td>
</tr>
<tr>
<td>Date Submitted</td>
<td>17/07/2014</td>
</tr>
<tr>
<td>Date Registered</td>
<td>22/08/2014</td>
</tr>
<tr>
<td></td>
<td>Retrospectively registered</td>
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</tbody>
</table>

**Page 1**

<table>
<thead>
<tr>
<th>Public title</th>
<th>The Effect of a Self-Development Coaching Program on the Psychological Health and Academic Performance among Dental and Medical Students in Saudi Arabia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study title in 'Participant-Intervention-Comparator-Outcome (PICO) format'</td>
<td>Does a self-development coaching program &quot;How to be an ultra Super Student&quot; in compare to a placebo program, lead to improvements in depression, anxiety, stress, self-efficacy, satisfaction with life, and academic performance in dental and medical student at Makkah, Saudi Arabia?</td>
</tr>
</tbody>
</table>

**Secondary ID [1]**

| Nil |

**UTN**

| Trial acronym |

**Page 2**

**Health condition(s) or problem(s) studied:**

- depression
- anxiety
- stress
- self-efficacy level
- satisfaction with life level
- academic performance level

<table>
<thead>
<tr>
<th>Condition category:</th>
<th>Condition code:</th>
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<tbody>
<tr>
<td>Public Health</td>
<td>Epidemiology</td>
</tr>
<tr>
<td>Mental Health</td>
<td>Studies of normal psychology, cognitive function and behaviour</td>
</tr>
</tbody>
</table>

**Page 3**

| Descriptions of intervention(s) / | "How to Be an Ultra Super Student" is a self-development coaching program developed and has been run by a self-development coach and trainer since 2008. The contents were derived from |

---
the coach personal experiences and from reading and practicing self-development for years. The content was not validated neither formed according to evidence-based resources in 2008. Nevertheless, the program has been under the coach continues adjustments using coachees’ feedback. The program aims mainly to improve students' academic performance and improve their psychological health. The program is not using psychological therapeutic approaches, but rather uses series of skills and conceptual ideas about studying and coping with challenges during the academic journey, so participants can use them if they want. The program is delivered as live course in a large lecture theatre at students’ free time where participants are supplied by each program's booklet and the program's audio CD. The program modules are: (1) Unleash your inner power: where information about self-efficacy and goals in life are discussed. (2) Manage your time effectively: different models and tips to utilize studying time efficiently. (3) The maximum usefulness of universities' lecture: different solutions to increase lecture time efficiency. (4) How to study and memorize effectively: skills with exercise to memorize better. (5) Dealing with exams: practical tips to deal with exams’ time. (6) Religious teaches: Islamic teaches augment the previous skills and values in the Saudi religious cultural.

The CD content: (1) 24 study-motivation audio files. (2) Short version of muscle relaxation and positive messages. (3) Long version of muscle relaxation and positive messages. The program's way of conduction are: motivational voice tone and body language, success and Islamic stories (Parable), famous people and Islamic quotes (Metaphor), recontextualized ideal, personification of some values, showing movie clips, direct interacting with audience, and give coachee the freedom to choose among program’s techniques that suits him/her. The program is conducted over 2 days, 5 hours/day.

<p>| Intervention Code: | Behaviour |
| Comparator / control treatment | &quot;Learning and Success in Health Faculties” program was developed during the preparation for this study only. The program was only offered to those in the control group for the purposes of this study and it is not part of the University curriculum. It aims to provide information about learning in health faculties and the factors leading to success according to a scientific literature review. It also gives a brief on scientific research in public health field. All the information that is provided in the LSHF are scientifically validated materials that are taken from academic articles or academic books. The program is delivered as live course in a large lecture theatre at students’ free time where participants are supplied by each program's booklet and the program's audio CD. Program modules are: (1) blooms' Taxonomy, (2) scientific data about variables association with success in health faculties such as the language, income, etc., with no practical points, (3) active learning potential use in health faculties, and (4) the importance of scientific research. CD contents are: 24 audio files resembling the content of the program. Program's conduction way is as the normal and standard university way of presenting a lecture that allow for short question to be answered be answered alone or in groups. The program is conducted in one day for 4 hours. |
| Control group | Placebo |
| Page 4 | Depression (DASS-21 depression sub-scale) |
| Time point: | Baseline (before the intervention by 3 months), immediately before the intervention, after the intervention with one week, and after the intervention by 5 weeks. |
| Primary Outcome: | Anxiety (DASS-21 anxiety sub-scale) |
| Time point: | Baseline (before the intervention by 3 months), immediately before the intervention, after the intervention with one week, and after the intervention by 5 weeks. |
| Primary Outcome: | Stress (DASS-21 stress sub-scale) |
| Time point: | Baseline (before the intervention by 3 months), immediately before the intervention, after the intervention with one week, and after the intervention by 5 weeks. |
| Secondary Outcome: | Credibility and expectancy mean score using (Credibility and Expectancy Questionnaire CEQ). |</p>
<table>
<thead>
<tr>
<th>Time point:</th>
<th>Immediately before the intervention, and after the intervention with one week.</th>
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<tbody>
<tr>
<td>Secondary Outcome:</td>
<td>coach and coaching characteristics rating by participants: 11 question to ask about: Coachee satisfaction with the program, using personal experience of the coach, coaching program relevance, coach’s ability to get coachee’s attention, coach confidence, coach as a role model, having experience in the coach’s program content, coach convincing level, coach motivation level, coach ability to influence the coachee emotional, and coach empathy</td>
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<tr>
<td>Time point:</td>
<td>Only after the intervention by a week</td>
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<td>Secondary Outcome:</td>
<td>Academic performance, measured by students’ academic grades</td>
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<td>Time point:</td>
<td>Before the intervention at the 1st semester, and after the intervention by 3 months at the end of the second semester.</td>
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<tr>
<td>Secondary Outcome:</td>
<td>Self-efficacy mean score using (General Self-Efficacy Scale GSE)</td>
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<tr>
<td>Time point:</td>
<td>Baseline (before the intervention by 3 months) , immediately before the intervention, after the intervention with one week, and after the intervention by 5 weeks.</td>
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<tr>
<td>Secondary Outcome:</td>
<td>Satisfaction with life mean score (using Satisfaction With Life Scale SWLS).</td>
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<tr>
<td>Time point:</td>
<td>Baseline (before the intervention by 3 months) , immediately before the intervention, after the intervention with one week, and after the intervention by 5 weeks.</td>
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**Key inclusion criteria**

1. Students in the 2nd/3rd years.
2. Medical/dental students
3. Students from Umm Al-Qura University

**Minimum age**

20 Years

**Maximum age**

25 Years

**Gender**

Both males and females

**Healthy volunteers?**

Yes

**Key exclusion criteria**

1. Already attended (How to be an Ultra Super Student) program during his/her academic life in the university.
2. Has a major psychological disorder (on psychological medication or seeing psychiatrist for mental disease)
3. Did not sign the study consent.

**Study type**

Interventional

**Purpose of the study**

Educational / counselling / training

**Allocation to intervention**

Randomised controlled trial

**Describe the procedure for enrolling a subject and allocating the treatment (allocation concealment procedures)**

The study was advertised via large roll up posters and students were recruited at the first term via invitation’s envelopes that contained coloured flyer about the programs, study information sheet and the consent form. After receiving participants signed consent, participated were randomly allocated into interventional group (IG) and control group (CG) by the principle investigator. When the principle investigator received students consent forms, participants listed were exactly as they were received without any manipulation or rearrangement to their IDs or for any reasons. After that, the principle investigator generated a random numbers list (using excel commands) and put it in front of participants ID. It was determined before that each participant that got an odd number (from the random list) will be allocated to the study group, and each even number was allocated to the control group. This step was not influence.
The students and research assistants who managed the study protocol and data collection were blinded. The intervention was conducted at the first week of the second term. Students knew their assigned group before the conducting both programs by one week.

Participants were stratified into medical and dental strata, then randomised into interventional and control group using computer generated random number tables done by the principle investigator using Excel software. These numbers were random by chance. It was not based on students birthday, or their ID in the university or any other factor. After that, we put students list into the tables. Participants with odd number were allocated to the interventional group, with the participants with even number were allocated to the control group. Every student has a chance of 50% to be at either group.

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<table>
<thead>
<tr>
<th>Describe the methods used to generate the sequence in which subjects will be randomised (sequence generation)</th>
<th>Participants were stratified into medical and dental strata, then randomised into interventional and control group using computer generated random number tables done by the principle investigator using Excel software. These numbers were random by chance. It was not based on students birthday, or their ID in the university or any other factor. After that, we put students list into the tables. Participants with odd number were allocated to the interventional group, with the participants with even number were allocated to the control group. Every student has a chance of 50% to be at either group.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masking / blinding</td>
<td>Blinded (masking used)</td>
</tr>
<tr>
<td>Who is / are masked / blinded (choose all that apply)</td>
<td>The people receiving the treatment/s The people administering the treatment/s</td>
</tr>
<tr>
<td>Assignment</td>
<td>Parallel</td>
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<tr>
<td>Other design features</td>
<td>It should be note that the principle investigator who ran the intervention by himself was not blinded. However, the research assistants who advertised the study, helped in conducting the intervention, and collected the data, were blinded. Also, the students know their assigned group: Program A/ Program B, however, non of them know that &quot;program A&quot; was the main intervention. All students were invited to participate in this study that offered a chance to be on either groups on random bases. Each student who agreed to participate was informed with his program before a week of both program, so they would attend the program on the specific day and time. However, no student knew that this was that program A was the self-development program that we aimed to study. Students on both groups thought that researchers wanted to assess the effectiveness of both groups.</td>
</tr>
<tr>
<td>Type of endpoint(s)</td>
<td>Efficacy</td>
</tr>
<tr>
<td>Statistical Methods/Analysis</td>
<td>Repeated measure ANCOVA Post hock paired t-test and independent t-test</td>
</tr>
<tr>
<td>A sample size of 130 (65 at each group) participants was needed. A study power of 90 (B=0.1), alpha=0.05, minimal clinical difference of 4 points in any of the psychological health means, and an average standard deviation of 7 derived from a recent well-designed coaching RCT which used DASS-21. 130 was multiplied by 1.5 for the design effect (multiple follow-up). This number was again multiplied by 1.5 for the estimated non-response rate (50%) and multiplied by 1.2 for estimated drop-out during the follow-up (20%), with the result that 351 students.</td>
<td></td>
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<td>Phase</td>
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<tr>
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<tr>
<td>Date of first participant enrolment</td>
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<td>Actual date last participant recruited/enrolled</td>
<td>30/11/2012</td>
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<tr>
<td><strong>Target sample size</strong></td>
<td>130</td>
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<td>------------------------</td>
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<td><strong>Recruitment status</strong></td>
<td>Closed: follow-up complete</td>
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</table>

**Recruitment outside Australia**

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<tr>
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<th>Saudi Arabia</th>
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</thead>
<tbody>
<tr>
<td><strong>State/Province</strong></td>
<td>Makkah</td>
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**Page 8**

<table>
<thead>
<tr>
<th><strong>Funding Source</strong></th>
<th>University</th>
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<tbody>
<tr>
<td><strong>Name</strong></td>
<td>Faculty of Dentistry, Umm Al-Qura University</td>
</tr>
<tr>
<td><strong>Address</strong></td>
<td>Faculty of Dentistry, Umm Al-Qura University, Makkah (21955) P.O. Box 715 Saudi Arabia</td>
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<tr>
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</tr>
<tr>
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<td><strong>Secondary Sponsor</strong></td>
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<tr>
<td><strong>Name</strong></td>
<td>Queensland University of Technology</td>
</tr>
<tr>
<td><strong>Address</strong></td>
<td>Postal address: Faculty of Health, QUT Victoria Park Road Kelvin Grove QLD 4059</td>
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| **Country** | Australia |

**Page 9**

<table>
<thead>
<tr>
<th><strong>Has the study received approval from at least one Ethics Committee?</strong></th>
<th>Yes</th>
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<tr>
<td><strong>Ethics Committee name</strong></td>
<td>Queensland University of Technology Human Research Ethics Committee</td>
</tr>
<tr>
<td><strong>Address</strong></td>
<td>Queensland University of Technology Research Ethics Unit Level 4, 88 Musk Avenue Kelvin Grove, QLD, 4059</td>
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<td><strong>Submitted Date</strong></td>
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This project is being undertaken as part of PhD study. The purpose of this project is to evaluate the effect of a self-development coaching program on the psychological health and academic performance among dental and medical students in Saudi Arabia.

<table>
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<tr>
<th>Principal Investigator</th>
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<td><strong>Email:</strong></td>
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<tr>
<td>Contact person responsible for updating information</td>
</tr>
<tr>
<td>------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Title:</strong> Mr</td>
</tr>
<tr>
<td><strong>Name:</strong> Khalid Aboalshamat</td>
</tr>
<tr>
<td><strong>Address:</strong> Queensland University of Technology (QUT) Faculty of Health, school of public health and social work O-Block, Room C603, Victoria Park Road Kelvin Grove 4059 QLD, Brisbane, Australia</td>
</tr>
<tr>
<td><strong>Country:</strong> Australia</td>
</tr>
<tr>
<td><strong>Email:</strong> <a href="mailto:dr.khalid.sh@hotmail.com">dr.khalid.sh@hotmail.com</a></td>
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