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# Workplace interventions to improve truck drivers' health knowledge, behaviours and self-reported outcomes

Marguerite C. Sendall, Phil Crane,  
Laura K. McCosker, Herbert C. Biggs,  
MaryLou Fleming and Bevan Rowland

## Peer reviewed paper

This paper has been critically reviewed by at least two recognised experts in the relevant field.

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## Abstract

A significant number of Australians are employed in the road transport industry. Research identifies road transport industry workers, particularly truck drivers, as being at increased risk of chronic disease. In part, this is because truck drivers' working environment restricts their capacity to engage in physical activity and limits their access to healthy food options. Workplaces are now widely recognised as effective platforms for health promotion. Research suggests health promotion interventions in blue-collar workplaces can be effective in improving workers' health knowledge, behaviour and outcomes. However, truck drivers' workplaces are their vehicles, and so they are identified as a 'hard-to-reach' group for health promotion.

This mixed-methods project implemented health promotion interventions in six road transport industry workplaces in Queensland, Australia. The project achieved improvements in key aspects of truck drivers' health knowledge, health behaviour and self-reported health outcomes. This was underpinned by positive changes in the health-related culture of participating workplaces. This project demonstrates Participatory Action Research (PAR) processes – including the development of robust relationships between the project team and workplace managers, changes in workplace culture and the effective contextualisation of interventions – can be successful in improving the health of this 'hard-to-reach' group.

## INTRODUCTION

More than 216 000 Australians are employed in the road transport industry (Australian Bureau of Statistics 2014). Health research has consistently identified Australian road transport industry workers as being at increased risk of chronic disease. Large waist circumference and obesity reportedly places 70% of the workers in the

Australian transport industry at increased risk of chronic disease (Wong et al. 2014). In Queensland, compared to other workers, those in the transport industry have the highest incidence of health risk due to waist circumference, the second highest incidence of overweight or obesity measured by BMI and the third highest incidence of physical inactivity (Council on Federal Financial Relations 2010). Obesity poses significant costs to employers, particularly in terms of increased rates of absenteeism, productivity loss and workers' compensation claims (Blackburn 2008; Heinen & Darling 2009). The scale and complexity of the obesity epidemic in developed nations demands a multifaceted response from all sectors of society, including workplaces (Blackburn 2008).

The health of truck drivers is impacted by limitations of their working environment. The sedentary nature of the job and long work hours restrict truck drivers' capacity to engage in physical activity and limits their access to healthy food options (Dahl et al. 2009; Layne, Rogers & Randolph 2009; Olson et al. 2009). Poor worker health impacts on safety, performance, recruitment, retention and overall business productivity. For this reason, workplaces are increasingly identified as environments requiring health promotion intervention (Department of Health and Ageing 2010; Rongen et al. 2013). The presence of natural social networks, the potential to reach a large audience and the amount of time people, particularly truck drivers, spend at work means workplaces are now widely recognised as effective platforms for health promotion (Apostolopoulos et al. 2012; Rongen et al. 2013). However, as they do not have a traditional workplace or a set work roster, it is difficult to effectively engage truck drivers in workplace health promotion interventions (Hill, Sendall & McCosker 2015).

The *Queensland Transport Industry Workplace Health Intervention* was a settings-based mixed-methods project within a Participatory Action Research (PAR) framework. Its objective was to identify health promotion interventions suitable for implementation in Australian transport industry workplaces. The interventions were designed to support truck drivers to increase physical activity and to access healthy foods at work. Over a two-year period, the project worked with six transport industry workplaces in south-east Queensland to develop, implement and evaluate a range of health promotion interventions – including a free fruit initiative, a 10 000 steps challenge and a Facebook webpage called *Truckin' Healthy*. The project resulted in improvements in key aspects of the health knowledge, health behaviour and

self-reported health outcomes of participating truck drivers and a positive change in workplace culture. This paper will present these findings and elucidate how the PAR process facilitated these positive results.

Ethics approval for this project was obtained from the Queensland University of Technology Human Research Ethics Committee (Approval Number QUT 1300000412). This project was funded by the Queensland Government under the Healthier. Happier. Workplaces Initiative.

## METHODS

Transport industry organisations in the south-east Queensland region were recruited over two phases to participate in the project. First, transport organisations known to members of the project team were contacted. Second, workplaces identified as members of the Australian Trucking Association's *TruckSafe* program – which sets industry standards to promote a safe, professional trucking industry in Australia – were contacted. At each organisation, a manager who had the ability to make decisions or talk directly to a decision-maker was identified, informed of the project's purpose, and asked a number of screening questions about the organisation's size and structure to determine eligibility. If the organisation met the project's eligibility criteria, project information and a formal request to participate were sent to the workplace manager via email. A total of six workplaces from five different transport industry organisations participated in the project.

The project used PAR, a recognised public health methodology, to actively engage stakeholders in the development, implementation and evaluation of collaborative solutions to shared problems (Crane & O'Regan 2010). There is extensive evidence to suggest the involvement of stakeholders in health promotion projects through decision-making and planning is more likely to produce meaningful change (Judd & Keleher 2013). PAR processes are particularly beneficial in workplace health promotion because, as complex natural settings, workplaces require responsiveness, flexibility and contextualisation (Judd & Keleher 2013). For this project, PAR processes were used as part of a wider mixed-methods approach.

Typically, PAR processes are participant-led and the project team acted as facilitators (Munn-Giddings, Hart & Ramon 2005). The project team engaged truck drivers and workplace managers in the PAR process in a number of ways, including one-on-one interviews to explore physical activity and

healthy eating in the context of a truck driver's day-to-day life; focus groups which obtained qualitative information about truck drivers' health, healthy eating and physical activity experiences and perceptions about health at work; and paper-based evaluation surveys. Findings from these activities were regularly 'fed back' to the workplaces, verbally and in written format, to inform intervention design. PAR processes enabled the project team to harness truck drivers' and workplace managers' knowledge, perceptions and preferences during the development, implementation and evaluation of the workplace health interventions, take advantage of existing skills and resources, build engagement and deliver more rigorous outcomes (Crane & O'Regan 2010).

Through the PAR process, a total of seven workplace health promotion interventions were developed:

1. Healthy eating posters displayed in the workplace
2. Healthy options vending machine in the workplace
3. Supply of free fruit to drivers
4. A 10 000 steps workplace challenge
5. Healthy eating and/or physical activity toolbox talks
6. Health messages distributed to drivers (e.g. in their payslips)
7. The *Truckin' Healthy* Facebook webpage

Each workplace implemented three or four interventions during a six-month period. The project team worked closely with workplace managers to negotiate interventions to implement in each workplace and how this would be achieved. Workplace managers decided which interventions to implement based on their workplace's capacity, logistical constraints such as time and cost, the availability of drivers, drivers' preferences and an assessment of each intervention's potential effectiveness. The project team supported the workplace managers to implement chosen interventions by providing resources (e.g. prepared posters, PowerPoint slides, health messages) and practical guidance. During the intervention period, the project team maintained regular contact with the workplace managers via telephone, email and worksite visits.

Data collection was undertaken at each workplace at three time-points: pre-intervention, post-intervention (three months after intervention commenced) and final follow-up (six months

after intervention commenced). As it was a mixed-methods project, quantitative and qualitative data were collected. This paper will focus on reporting the quantitative data; qualitative data is reported elsewhere. Quantitative data was obtained via paper-based surveys distributed to truck drivers and workplace managers at all three time-points. Workplace managers were responsible for facilitating drivers' completion of the surveys. The workplace managers returned the completed surveys to the project team by mail or email.

The surveys used numerical scales (e.g. number of hours, serves, times per week, etc.), Likert scales (e.g. 1 = strongly agree to 5 = strongly disagree, 1 = very satisfied to 5 = very dissatisfied) and checkboxes to collect quantitative data. At pre-intervention, the survey obtained information about truck drivers' demography, health, healthy eating and physical activity experiences, perceptions about healthy eating and physical activity at work, and general thoughts about workplace health. At post-intervention, the survey obtained information about *changes* in these key outcome measures and truck drivers' views about intervention activities, including engagement and satisfaction with each activity. At the final follow-up, key outcomes measured at post-intervention were re-measured to observe changes over time.

The rate of truck driver participation in the surveys declined steadily throughout the intervention period. At pre-intervention 46 surveys were returned from 6 workplaces (five organisations). At post-intervention 22 surveys were returned from 4 workplaces (three organisations). At final follow-up 6 surveys were returned from 1 workplace. The high rate of attrition was not fully explored; however, it may be underpinned by challenges associated with prioritising and sustaining long-term changes in workplace culture. The final follow-up results will *not* be reported because of the limitations associated with the small, select sample.

## FINDINGS

A total of 6 workplaces from 5 different transport industry organisations participated in the project (see *Table 1*). None of the workplaces reported undertaking workplace-based health promotion activities at pre-intervention.

A total of 46 truck drivers participated in pre-intervention data collection, and 22 truck drivers participated in post-intervention data collection (see *Table 2*). The demographic characteristics of pre- and post-intervention groups are very similar.

**Table 1**  
**Information about participating transport industry companies**

Transport organisation	Type of freight	Journey types	Size	Participating depots	Participating workers	
					Pre-intervention ( <i>n</i> = 46)	Post-intervention ( <i>n</i> = 22)
1	Bulk haulage (e.g. mineral sand, coal, gravel, lime, sawdust, grains, general freight, etc.)	Local (day) trips; long-distance within states; long-distance across states	Large (>150 truck drivers)	Pinkenba, Tivoli	9	5
2	General freight (e.g. mattresses, security screens, industrial ingredients, etc.)	Local (day) trips; long-distance within states; long-distance across states	Medium (>50 truck drivers)	Port of Brisbane	7	0
3	Livestock (e.g. sheep, cattle, pigs, etc.)	Local (day) trips; long-distance within states; long-distance across states	Medium (>50 truck drivers)	Warwick	13	10
4	Fresh fruit and vegetables	Local (day) trips; long-distance within states; long-distance across states	Small (<25 truck drivers)	Stanthorpe	10	7
5	General freight (e.g. clothing, toys, manchester, cold goods, etc.)	Local (day) trips; long-distance within states; long-distance across states	Large (>150 truck drivers)	Warwick	7	0

At the conclusion of the project, 100% (*n* = 6) of workplaces reported displaying healthy eating posters, 67% (*n* = 4) of workplaces supplied free fruit to drivers, 67% (*n* = 4) of workplaces promoted the *Truckin' Healthy* Facebook webpage, 50% (*n* = 3) of workplaces delivered healthy eating and/or physical activity toolbox talks, 33% (*n* = 2) of workplaces distributed health messages to drivers, 17% (*n* = 1) of workplaces ran a 10 000 steps workplace challenge and 0% (*n* = 0) of the workplaces installed a healthy options vending machine in the workplace.

### Truck drivers' nutrition knowledge, behaviour and workplace perceptions

Overall, there were improvements in truck drivers' knowledge of Australian nutrition guidelines between pre- and post-intervention periods (see

Table 3). Drivers' knowledge about the number of daily serves a fruit increased by 11%, and knowledge about the number of daily serves of vegetables increased by 16%. There were improvements in truck drivers' nutrition behaviours in the pre- to post-intervention period. Drivers' consumption of the guideline-recommended number of daily serves of fruit increased by 23%, and consumption of the guideline-recommended number of daily serves of vegetables increased by 21%. There were no changes in truck drivers' consumption of unhealthy food or drink.

There were overall improvements in drivers' perceptions of healthy eating at the workplace. When asked at pre-intervention whether it was easy for them to eat healthy foods at work, 45% (*n* = 20) of drivers either 'agreed' or 'strongly agreed'. This increased to 72% (*n* = 16) at post-intervention.

**Table 2**  
**Demographic characteristics of participating truck drivers**

	Pre-intervention		Post-intervention	
	<i>n</i>	(%)*	<i>n</i>	(%)*
<b>Gender</b>				
Male	44	100%	22	100%
Female	0	0%	0	0%
<b>Age</b>				
16–19 years	1	2%	0	0%
20–29 years	4	9%	5	24%
30–39 years	6	13%	4	19%
40–49 years	11	24%	4	19%
50–59 years	19	43%	7	33%
60–69 years	4	9%	1	5%
<b>Marital status</b>				
Married or living together	30	66%	12	57%
Divorced	6	13%	2	10%
Single	9	20%	7	33%
Other	1	1%	0	0%
<b>Level of education</b>				
Primary school	3	8%	0	0%
High school – Year 10	18	46%	11	52%
High school – Year 12	5	13%	4	19%
Trade certificate	12	31%	5	24%
University degree	1	2%	1	5%
<b>Type of truck driving</b>				
Long distance across states	9	18%	4	18%
Long distance within states	1	2%	2	9%
Local/day trips	18	40%	11	50%
Mixture	18	40%	5	23%
<b>Average hours of work</b>				
8 hours per day	2	4%	3	15%
9 hours per day	6	13%	3	15%
>9 hours per day	38	83%	14	70%

\* Responding truck drivers only.

When asked at pre-intervention whether they felt confident to increase their intake of healthy foods at work, 65% ( $n = 30$ ) of drivers either 'agreed' or 'strongly agreed'. This increased to 77% ( $n = 17$ ) at post-intervention.

### **Truck drivers' physical activity knowledge, behaviour and workplace perceptions**

Overall, there was a decline in truck drivers' knowledge of Australian physical activity guidelines in the pre- to post-intervention period

(see *Table 4*). Drivers' knowledge of the guideline-recommended number of days per week of physical activity declined by 15%, and knowledge of the guideline-recommended number of minutes per day of physical activity declined by 7%. There were no improvements in truck drivers' physical activity behaviours in the pre- to post-intervention period. There were positive changes in truck drivers' sedentary behaviour, because the number of truck drivers who reported sitting for 9 or more hours

**Table 3**  
**Truck drivers' nutrition knowledge and behaviours**

	Pre-intervention		Post-intervention	
	<i>n</i>	(%)*	<i>n</i>	(%)*
<b>Knowledge – serves of fruit/day</b>				
Consistent with Australian guideline-recommendations	18	39%	11	50%
Not consistent with Australian guideline-recommendations	27	61%	11	50%
<b>Knowledge – serves of vegetables/day</b>				
Consistent with Australian guideline-recommendations	1	2%	4	18%
Not consistent with Australian guideline-recommendations	44	98%	18	82%
<b>Behaviour – serves of fruit/day</b>				
Consistent with Australian guideline-recommendations	33	72%	21	95%
Not consistent with Australian guideline-recommendations	12	28%	1	5%
<b>Behaviour – serves of vegetables/day</b>				
Consistent with Australian guideline-recommendations	5	11%	7	32%
Not consistent with Australian guideline-recommendations	40	89%	15	68%
<b>Behaviour – unhealthy foods<sup>1</sup> consumed</b>				
On no days of the week	3	7%	2	9%
On some days of the week (1–2 days)	23	50%	12	54%
On many days of the week (3–4 days)	10	22%	3	14%
On most days of the week (5–7 days)	10	21%	5	23%
<b>Behaviour – unhealthy drinks<sup>2</sup> consumed</b>				
0 cans/bottles per day	11	24%	4	18%
1–2 cans/bottles per day	24	53%	15	68%
3–4 cans/bottles per day	8	17%	3	15%
5–6 cans/bottles per day	2	4%	0	0%
7+ cans/bottles per day	1	2%	0	0%

<sup>1</sup> 'Unhealthy foods' were defined as those high in saturated fat, added salt or added sugar.

<sup>2</sup> 'Unhealthy drinks' were defined as those high in sugar.

each day at work declined by 26% pre- to post-intervention.

There were overall improvements in truck drivers' perceptions of physical activity at the workplace. When asked at pre-intervention whether it was easy for them to be physically active at work, 26% ( $n = 13$ ) either 'agreed' or 'strongly agreed'. This increased to 68% ( $n = 15$ ) at post-intervention. When asked at pre-intervention whether they felt confident to increase their level of physical activity at work, 45%

( $n = 20$ ) either 'agreed' or 'strongly agreed'. This increased to 64% ( $n = 14$ ) at post-intervention.

### Truck drivers' other health outcomes

There were improvements in a range of other health outcomes for truck drivers in the pre- to post-intervention period (see Table 5). There was an improvement in truck drivers' self-reported health ratings, with the number of drivers reporting their health as 'good', 'very good' or 'excellent' increasing

**Table 4**  
**Truck drivers' physical activity knowledge and behaviours**

	Pre-intervention		Post-intervention	
	<i>n</i>	(%)	<i>n</i>	(%)
<b>Knowledge – number of days/week of physical activity</b>				
Consistent with Australian guideline-recommendations	33	73%	13	58%
Not consistent with Australian guideline-recommendations	12	27%	9	42%
<b>Knowledge – number of minutes/day of physical activity</b>				
Consistent with Australian guideline-recommendations	34	76%	15	69%
Not consistent with Australian guideline-recommendations	11	24%	7	31%
<b>Behaviour – 30+ min moderate-intensity physical activity</b>				
0 times per week	6	23%	5	23%
1–2 times per week	16	24%	6	24%
3–4 times per week	9	20%	4	20%
5–6 times per week	5	10%	2	10%
7+ times per week	8	23%	5	23%
<b>Behaviour – 15+ min vigorous-intensity physical activity</b>				
0 times per week	7	16%	5	23%
1–2 times per week	13	30%	4	18%
3–4 times per week	11	26%	8	37%
5–6 times per week	6	14%	4	18%
7+ times per week	6	14%	1	4%
<b>Behaviour – hours/day spent sitting at work</b>				
0–3 hours	3	6%	8	37%
4–6 hours	15	33%	9	41%
7–9 hours	9	21%	2	9%
9+ hours	18	40%	3	14%

by 11%. There were improvements in truck drivers' reported readiness to make lifestyle changes to improve their health, with the number of drivers reporting they were 'currently making lifestyle changes to improve their health' increasing by 18%. There were improvements in truck drivers' body mass index (BMI), with the number of drivers reporting their BMI as 'obese' (>30.1) decreasing by 16%.

#### **Truck drivers' perceptions of workplace culture**

There were overall improvements in the healthy eating culture at the workplaces in the pre- and post-intervention period (see *Table 6*). Drivers' perception of the value of healthy eating at work increased by 50%, and the perception of others' encouragement of healthy eating at work increased by 59%. There were improvements in the physical activity culture at the workplaces in the pre- to post-intervention period. Drivers' perception of the value of physical activity at work increased by



**Table 5**  
**Truck drivers' other health outcomes**

	Pre-intervention		Post-intervention	
	<i>n</i>	(%)	<i>n</i>	(%)
<b>Self-reported health rating</b>				
Excellent	3	7%	3	14%
Very good	9	20%	4	18%
Good	20	44%	11	50%
Fair	10	22%	2	9%
Poor	3	7%	2	9%
<b>Self-reported readiness to make lifestyle changes</b>				
Unable to make changes	2	4%	2	10%
Do not need to make change	3	7%	3	14%
Do not want to make changes	5	11%	0	0%
May make changes	8	18%	3	14%
Currently making changes	9	20%	8	38%
Plan to make changes	9	20%	3	14%
Have made, maintained changes (>3 months)	9	20%	2	10%
<b>Self-reported body mass index (BMI)<sup>1</sup></b>				
<18.5 (underweight)	1	3%	1	5%
18.6 to 25.0 (healthy weight)	10	23%	4	20%
25.1 to 30.0 (overweight)	12	28%	9	45%
>30.1 (obese)	20	46%	7	30%

<sup>1</sup> Calculated from truck drivers' self-reported height and weight.

19%, and the perception of others' encouragement of physical activity at work increased by 25%. Drivers' perceptions of managers' and other drivers' engagement in healthy eating and physical activity in the workplace also increased.

For many truck drivers, the workplace became a key source of health information. At pre-intervention, most drivers reported receiving health information from a general practitioner (67%, *n* = 31) or family and friends (37%, *n* = 17). At post-intervention, most drivers reported receiving their health information from a general practitioner (59%, *n* = 13) or their workplace (36%, *n* = 8).

## DISCUSSION

This project builds on previous research that suggests health promotion interventions implemented in blue-collar workplaces can be effective in improving the health of workers (Olson et al. 2009; Linde et al. 2012; Rongen et al. 2013; Kwon, Marzec & Edington 2015). Through the implementation of health promotion interventions in six transport industry workplaces, this project achieved positive changes in truck drivers' health

knowledge and health behaviours, particularly those related to nutrition. The project resulted in positive changes in truck drivers' self-reported health rating, body mass index (BMI) and readiness to make health-related lifestyle changes. This was underpinned by positive changes in the culture of participating workplaces, particularly with regards to workplaces valuing, encouraging and modelling healthy nutrition and physical activity behaviours and the perceived ease of drivers' engagement in healthy behaviours at work. The interventions themselves and the PAR processes involved in the development, implementation and evaluation of the interventions resulted in these positive changes.

The most important of the PAR processes utilised in this project was the development of collaborative relationships between the project team and the workplace managers. The project team maintained collaborative relationships with workplace managers by using a variety of techniques, including worksite visits, emails and text messages, according to each manager's preference. This created a cycle of information that comprehensively informed intervention design,

**Table 6**  
**Truck drivers' perceptions of workplace culture**

	Pre-intervention		Post-intervention	
	<i>n</i>	(%)	<i>n</i>	(%)
<b>HEALTHY EATING</b>				
<b>Is healthy eating valued at the workplace?</b>				
Strongly agree / agree	10	23%	16	73%
Neutral / disagree / strongly disagree	35	77%	6	27%
<b>Is healthy eating encouraged at the workplace?</b>				
Strongly agree / agree	8	18%	17	77%
Neutral / disagree / strongly disagree	37	82%	5	23%
<b>Do managers/supervisors eat healthily at work?</b>				
Strongly agree / agree	3	7%	12	55%
Neutral / disagree / strongly disagree	42	93%	10	45%
<b>Do other truck drivers eat healthily at work?</b>				
Strongly agree / agree	4	9%	6	27%
Neutral / disagree / strongly disagree	41	91%	16	73%
<b>PHYSICAL ACTIVITY</b>				
<b>Is physical activity valued at the workplace?</b>				
Strongly agree / agree	22	49%	15	68%
Neutral / disagree / strongly disagree	23	51%	7	32%
<b>Is physical activity encouraged at the workplace?</b>				
Strongly agree / agree	5	11%	8	36%
Neutral / disagree / strongly disagree	40	89%	14	64%
<b>Are managers/supervisors physically active at work?</b>				
Strongly agree / agree	6	13%	9	41%
Neutral / disagree / strongly disagree	39	87%	13	59%
<b>Are other truck drivers physically active at work?</b>				
Strongly agree / agree	8	18%	6	27%
Neutral / disagree / strongly disagree	37	82%	16	73%

implementation and evaluation. The workplace managers with whom the project team had the strongest relationships implemented a greater number of health promotion interventions, and the truck drivers of these workplaces were the most actively engaged in the design, implementation and evaluation activities. Other studies about health promotion interventions in blue-collar workplaces suggest relationships are fundamental to effective outcomes in workplace contexts (Munn-Giddings et al. 2005). Workplace managers who drive change in blue-collar workplaces, and managers' attitudes and commitment to workplace health promotion are communicated down through workplaces (Rasmussen et al. 2006; Judd & Keleher 2013). This

is an effect that was seen to some degree in each of the workplaces that participated in this project, and it reinforces the importance of collaborative relationships between workplace managers and project teams.

Despite the importance of collaborative relationships to effective health promotion interventions in blue-collar workplaces, there are difficulties associated with maintaining these relationships over time. The project team encountered a variety of challenges to sustaining relationships with workplace managers and maintaining the managers' and truck drivers' engagement in the project – including company amalgamations, organisational cost-cutting,

stresses associated with a drought and the demands of peak business periods. Other studies on health promotion interventions in blue-collar workplaces suggest problems with disengagement, and a decline in prioritisation of interventions over time are common (Kwon et al. 2015). Ongoing support and leadership from the project team is important (Rasmussen et al. 2006; Munn-Giddings et al. 2005; Judd & Keleher 2013). In periods of relationship stress, the project team focused on facilitating workplace momentum in intervention implementation in the workplaces. Allowing workplaces to maintain ownership of the project was essential to achieving a change in workplace culture that supported the success of the project.

Despite disengagement of participants over time, this project achieved positive results in improving truck drivers' health knowledge and behaviour. This was underpinned by positive changes in the culture of participating workplaces. Other studies about health promotion interventions in blue-collar workplaces suggest the success of workplace health promotion programs depends on workers' participation, and low rates of engagement generate only marginal improvements to workers' health, productivity and organisational costs (Kwon et al. 2015). Indeed, in a similar study in transport industry workplaces in the USA, Krueger et al. (2007: p. 39) conclude that integrating the health intervention/s throughout the workplace's operations 'is critical for long-term success'. Research has shown that interventions that focus on broader changes in workplace culture can generate positive, sustainable improvements in health behaviour and outcomes at the population level (Lingard & Turner 2015). Changes in workplace culture have been shown to be pivotal to the success of health promotion interventions in blue-collar workplaces. One of the primary reasons health promotion interventions in these workplaces fail is because workplace culture is not conducive to change (Oude Hengel et al. 2010; Judd & Keleher 2013). This project saw shifts in workplace culture consistent with the 'social ecological model' of health behaviour change (Lingard & Turner 2015), overcoming problems associated with participant disengagement and achieving positive health outcomes for truck drivers.

This project bought about a shift in workplace culture because it focused on contextualising interventions, allowing workplace managers to respond to the unique barriers and limitations, and harness the unique enablers and strengths of their workplace. Contextualisation is a key process of PAR (Crane & O'Regan 2010). The literature provides multiple examples of the disengagement of blue-

collar workers and managers from workplace health promotion interventions that are *not* contextualised. These interventions are, for example, inconsistent with rigid work schedules, or contradict pervasive masculine values (Iacuone 2005; Kolmet, Marino & Plummer 2006; Du Plessis et al. 2013; Lingard & Turner 2015) relevant to workers in the transport industry. During this project, the project team supported workplace managers to contextualise the health promotion interventions through implementation in a range of simple but innovative ways. For example, posters were displayed in different areas of the workplace to match driver traffic, and the content and timing of the toolbox talks were adapted to suit the needs and interests of different driver groups. The commitment of workplace managers to the health of their workforces, demonstrated through contextualised intervention, is a key factor underpinning positive culture changes in blue-collar workplaces and the success of health promotion interventions in these workplaces (Rasmussen et al. 2006).

## LIMITATIONS

There are several limitations that should be considered when interpreting the results of this project. First, as a convenience sample of truck drivers was utilised, there may be a self-selection bias in the sample population. All quantitative data was obtained via written surveys and truck drivers with low levels of literacy may have been excluded. The surveys relied on the anonymous self-reporting of data, including of height and weight measurements, but this may have resulted in socially-desirable or incorrectly-estimated responses. The Hawthorne effect, or an improvement in behaviour as a result of being observed by researchers, is a possibility (McCambridge, Witton & Elbourne 2014). The small sample size meant only descriptive analysis could be conducted, and only for the data collected at pre- and post-intervention. The highly contextual nature of the interventions limits the generalisability of findings.

## CONCLUSION

This project involved an analysis of the implementation of health promotion interventions in six Queensland road transport industry workplaces, using PAR processes. With the guidance of the project team, the participating workplaces implemented interventions to support truck drivers to increase physical activity and to access healthful foods at work. Despite a progressive decline in truck drivers' engagement in the project, positive changes in truck drivers' health knowledge, health

behaviours and self-reported health outcomes were achieved. This was underpinned by positive changes in the culture of participating workplaces, particularly with regards to workplaces valuing, encouraging and modelling healthy nutrition and physical activity behaviours, and the perceived ease of drivers' engagement in healthy behaviours at work.

The interventions themselves and the PAR processes involved in the development, implementation and evaluation of the interventions resulted in these positive changes. PAR processes, including the development of collaborative relationships between the project team and workplace managers and effective contextualisation of the interventions, generated positive changes in workplace culture. By achieving changes in workplace culture, the project overcame the problems associated with participant disengagement and achieved positive changes in reported health outcomes. The use of PAR processes to engage truck drivers is an important consideration for future health promotion intervention projects in road transport industry workplaces. Additionally, further research is required to improve our understanding of the dynamic relationship between PAR processes, workplace culture and truck drivers' health knowledge, health behaviours and self-reported health outcomes in Australian transport industry workplaces.

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### **Marguerite C. Sendall**

Dr Marguerite C. Sendall teaches public health and qualitative methodologies in the Bachelor of Public Health, and health promotion in the Master of Public Health at the Queensland University of Technology's School of Public Health and Social Work. Dr Sendall researches in the area of public health and, in particular, workplace health promotion with hard-to-reach groups.



### **Phil Crane**

Dr Phil Crane has an interest in human services policy and practice, with a particular focus on young people, and practice with individuals and communities that responds to complexity. His major interests include integrated and context-responsive approaches to practice and university–community engagement and innovation. His research is largely qualitative or mixed-method, with a particular interest in action research as a practice development and evaluation tool.



### **Laura K. McCosker**

Laura K. McCosker is Research Assistant and Project Officer (Research) at the Queensland University of Technology. She has a particular interest in public and youth health, health education and health sociology.



### **Herbert C. Biggs**

Professor Herbert C. Biggs is a Professor in the Queensland University of Technology School of Psychology and Counselling and the Centre for Accident Research and Road Safety – QLD (CARRS-Q). He is an industrial/organisational psychologist with an international reputation as a rehabilitation and injury management expert and extensive industry research interests.



### **MaryLou Fleming**

Professor MaryLou Fleming is Head of the School of Public Health and Social Work at the Queensland University of Technology. She has experience in teaching and research in higher education and public health and health promotion for over thirty years. Her research activity focuses on evaluation research, translational research and consultancy projects for Commonwealth and State Governments as well as the not-for-profit sector. She has co-authored two books, one on *Health Promotion* and an introductory Public Health textbook, and has written several book chapters.

Professor Fleming has been a member of a number of health-related committees in the non-government and government sectors including Health Promotion Queensland,

Board of the Wesley Research Institute, Board of Governors St Andrew's Hospital, National Heart Foundation and the Queensland Cancer Fund, the Quality Management Committee for BreastScreen Queensland. She has been a panel member for NHMRC project grants and the National Endeavour Awards selection panel. She is a member of the Public Health Association of Australia.



**Bevan D. Rowland**

Bevan D. Rowland is a Research Associate at the Queensland University of Technology within the Centre for Accident Research and Road Safety – Queensland. He has professional and academic qualifications and experience in Health, Safety and Environment and is a Certified Chartered Generalist OHS Professional. Mr Rowland's research interests include work-related road safety and general occupational safety.

**CONTACT**

Correspondence concerning this article should be addressed to Marguerite C. Sendall at the School of Public Health and Social Work, Queensland University of Technology, Victoria Park Road, Kelvin Grove, Queensland, Australia, 4059 or by email: [m.sendall@qut.edu.au](mailto:m.sendall@qut.edu.au)

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