

Psychological Wellbeing and Help-Seeking among Fly-In Fly-Out Employees in the Western Australian Mining Industry

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degree of Doctor of Philosophy

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Statement of Originality

This work has not previously been submitted for a degree or diploma in any university. 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 in the thesis itself.

(Signed) Philippa Milne

Date:

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I am incredibly fortunate to have received excellent support during the PhD; In particular, from Valerie (my mother) and Ian (father), Professor Grant Michelson and Associate Professor Denise Jackson (academic supervisors) as well as Doctor Susanne Bahn (industry supervisor).

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Abstract

The psychosocial health outcomes for fly-in, fly-out (FIFO) workers can be strongly influenced by whether or not they seek help and support. Yet there is an apparent puzzle whereby an increase in psychological distress can lead to a decrease in help-seeking. This may be due to an employee's heightened perceptions of mental health stigma, although research is yet to explain the underlying causes. Despite public interest and recent parliamentary inquiries into the mental health of fly-in, fly-out (FIFO) employees in the Australian mining industry, there is currently little empirical evidence to help explain this issue. Concerns about FIFO employee mental health and anecdotal reports of increased prevalence in this group have precipitated some empirical assessments using valid measures of mental health symptoms. The importance of examining mental health among the FIFO workforce and what factors influence this, and those variables that subsequently explain help-seeking among FIFO employees has been highlighted by some previous research.

Drawing on the Process Theory of Help-Seeking, the Theory of Planned Behaviour and the Jobs-Demands Resources model, this study surveyed the psychological wellbeing and help-seeking intentions of 629 FIFO employees in the Western Australian mining industry. A quantitative research strategy was employed, with a questionnaire survey used to collect FIFO workers' perceptions on adjustment, psychological wellbeing, stigma, help-seeking and job demands. The structural relationships between study variables were analysed to test the study hypotheses through the use of structural equation modelling (SEM). The thesis investigated (i) the mediating role of stigma on the links between adjustment, psychological distress and help-seeking, and (ii) the moderating role of job demands on these processes. The results showed that the demands of high-compression work rosters and long work hours affected how well FIFO workers could adjust and, in turn, contributed to psychological distress, signalling a need for prevention strategies to better protect the wellbeing of the mining workforce. The results also demonstrated that adjustment, psychological wellbeing and stigma all influenced employee help-seeking. This is a significant finding because it helps to predicate intervention and prevention strategies. In other words, the study contains practical implications for treating the psychological distress of FIFO mining employees, an area severely lacking in empirical research. Overall, the results of this thesis makes a contribution in terms of theory, research, and prevention and early intervention programs.

Author's Research Contributions

Please note that the author's surname changed from Vojnovic to Milne in 2018.

Milne, P., Michelson, G., & Jackson, D. (2018). The stigma of employee mental health in the Western Australian mining industry. Non-refereed paper presented at the *18th Labour, Employment and Work (LEW) Conference*, 29-30 November, Victoria University of Wellington, Wellington, New Zealand.

Vojnovic, P. (2016). Managing suicide risk for fly-in fly-out resource industry employees. *Journal of Health, Safety and Environment*, 32(2), 101-112.

Vojnovic, P., & Bahn, S. (2015). Depression, anxiety and stress symptoms among fly-in fly-out Australian resource industry workers. *Journal of Health, Safety and Environment*, 31(3), 207-223.

Vojnovic, P. (2015). Book review of 'Resource curse or cure? On the sustainability of development in Western Australia', edited by M. Brueckner, A. Durey, R. Mayes & C. Pforr, Springer, Heidelberg, 2014. This appeared in the *Australasian Journal of Environmental Management*, 22(1), 86-87.

Vojnovic, P., Michelson, G., Jackson, D., & Bahn, S. (2014). Adjustment, well-being and help-seeking among Australian FIFO mining employees. *Australian Bulletin of Labour*, 40(2), 242-261.

Vojnovic, P. (2014). Managing work-related suicide of fly-in/fly-out employees' in the Australian mining industry. Refereed paper presented at the *28th Academy of New Zealand and Australian Management (ANZAM) Conference*, 3-5 December, Sydney.

Author's Public Submissions

- Vojnovic, P.,** Jacobs, L.A., Tierney, Z., & Gallagher, S. (2017), Submission to the Infrastructure, Planning and Natural Resources Committee Inquiry regarding the Strong and Sustainable Resource Communities Bill 2016. FIFO Australian Community of Excellence. Brisbane, Australia.
- Vojnovic, P.,** Jacobs, L.A., Brook, L., Ashton, C., Cooke, D., Baldassar, L. (2015), Submission to the Planning and Natural Resources Committee parliamentary inquiry into fly-in, fly-out and other long-distance commuting work practices in Queensland. FIFO Australian Community of Excellence. Brisbane, Australia.
- Vojnovic, P.,** Jacobs, L.A., Brook, L., Ashton, C., & Pulé, P. (2014), Submission to the Health and Education Standing Committee of the Western Australian Legislative Assembly Inquiry into mental illness in fly-in, fly-out workers. FIFO Australian Community of Excellence. Perth, Australia.

Author's Media Contributions

During my study I participated in over 40 media interviews for radio, newspaper, resource industry magazines and national and state television news associated with the topic of mental health among fly-in, fly-out workers in the Australian mining industry.

Media television example: Sky News, October 2017. 'Mental health crisis in the fifo industry'. Available at <http://www.skynews.com.au/news/national/wa/2017/10/21/mental-health-crisis-in-the-fifo-industry.html>

Media radio example: The Science Show ABC radio program, interview with Robin Williams. October 10, 2015. 'The impact of flying-in and flying-out on workers mental health'. Available at <http://www.abc.net.au/radionational/programs/scienceshow/the-impact-of-flying-in-and-flying-out-on-workerse28099-ment/6842546>.

Media industry example: Mining Weekly Magazine. June 3, 2015. 'ECU study sees higher depression among FIFO workers'. Available at <http://www.miningweekly.com/article/ecu-study-sees-higher-depression-among-fifo-workers-2015-06-03>.

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Chapter 1 - Introduction

1.1 Introduction

Psychological wellbeing among Australian mining industry employees has emerged as an important issue, accompanied by a range of public policy and social implications. Despite the high cost to organisations of employee psychosocial hazards (e.g., long work hours, difficult work circumstances) and the consequences of employee mental health conditions (e.g., absenteeism due to depression), the impact of the working environment on psychological wellbeing has been largely unrecognised ([Britt & Jennings, 2017](#); [Dollard et al., 2017](#)). As a result, there is insufficient research on how and why working conditions create risks for employees' psychological wellbeing.

Psychological wellbeing is a significant contemporary issue for the Australian fly-in fly-out (FIFO) mining industry workforce. Indications are that FIFO employees are broadly inhibited from accessing mental health supports, mainly due to systemic structural barriers in the sector, but also attitudinal barriers, such as the stigma associated with mental health in general and help-seeking in particular. The overarching aims of this thesis are to extend our knowledge of psychological wellbeing prevalence and associated concerns among FIFO employees in the Australian mining industry and provide strategies for mitigating and better managing the risks associated with these issues.

Globally, land-based mining operations are often found in remote locations, for example, Newfoundland in Canada, the Pilbara Region in Western Australia (WA) and relatively isolated areas of Chile, Peru and Mongolia, to mention just a few. Many of these sparsely populated areas have under-developed infrastructure. In Australia, for most of the 1900s, temporary towns were constructed for workforces to live in with their families and the employees of businesses that serviced these settlements, such as shopkeepers and mechanics ([McKenzie et al., 2009](#)). Mining companies typically built accommodation and infrastructure in small existing towns, including temporary demountable buildings in certain circumstances, inextricably linking their future prosperity. With travel to major urban areas time consuming and expensive ([House of Representatives, 2013](#); [Storey, 2010](#)), the limited transport and communication constraints exacerbated the isolation of these settlements and it became difficult to attract appropriately skilled workers to these remote towns ([Bahn, Barratt-Pugh, & Yap, 2012](#)).

In response to the recruitment and retention challenges, employment arrangements in the Australian mining industry changed in the 1970s and 1980s, when many companies started to fly

labour into and out of mining locations regularly for short periods of time (e.g., for construction projects). Longer-term operational employees later followed, entrenching the use of FIFO employees as a labour strategy for mining companies. At the same time as the more permanent “company town” model declined, FIFO work in the mining industry changed from being a short-term and relatively uncommon form of employment to a more enshrined and usual way for employers to engage an ongoing operational workforce ([McKenzie, 2010](#); [Storey, 2010](#)). The term “fly-in, fly-out” (FIFO) was literally coined from these circumstances, where employees were flown into their mining locations and housed in close proximity to the mine site. At the end of their work schedule (one, two or more weeks) they flew back to their homes and families to enjoy a period of recreation leave before repeating the cycle.

In contemporary terms, the traditional company town is now largely an artefact of Australia’s past. Today, mining companies establish residential operations close to pre-existing communities and infrastructure that offer, at least, basic services ([McKenzie et al., 2009](#)). In Western Australia, the “FIFO employment model” is widely recognised as the more viable economic option, due to the transient and finite nature of large-scale mining projects. For mining companies, the advantages of FIFO working arrangements are numerous, including an increased ability to attract and retain skilled staff, mitigate risk associated with capital-intensive projects, as well as economic viability and long-term sustainability of their projects. For FIFO employees, the attractions include living in regional metropolitan centres or major cities with all the resources and infrastructure these contexts have to offer while working in a well-remunerated sector. The rise of the FIFO model of mining employment has been relatively well researched from both social and economic perspectives (see [McKenzie, 2010](#); [Tonts, McKenzie, & Plummer, 2016](#)). However, relatively little is known about its effects on the mental health of employees who undertake this type of work, characterised by frequent cycles of travel to remote workplaces where they are housed in temporary accommodation for lengthy periods of time followed by return travel home for a designated rest period.

The nature of these employment patterns disconnect FIFO mining workers from their usual social support networks in some of the most remote places on earth ([Gorman-Murray & Bissell, 2018](#)). While FIFO work has been known to assist employees achieve their occupational goals (e.g. financial remuneration, promotion), the employment arrangement is typically arduous and challenging. Long work hours and physically demanding roles in a male-dominated workplace are likely to create difficulties for adjusting employees ([Behr, 2012](#); [Peetz, Murray, & Muurlink, 2012](#)), and the evidence suggests there are barriers to accessing support that can assist employees

to cope with these job strains ([Henry et al., 2013](#)). Unlike the traditional company towns where mining employees resided with their families within a local community, there is a distinct separation of employees from their families, communities and support structures in the contemporary FIFO employment model.

Growing anecdotal reports and empirical evidence in the small body of literature indicate that FIFO mining employees experience substantial strain and problems with their mental health ([Bowers et al., 2018](#); [Henry et al., 2013](#)). Yet, the extent and reasons remain largely unknown. More broadly, research shows that organisational and individual health outcomes are greatly influenced by the mental health of individuals ([Bailey, Dollard, & Richards, 2015](#); [Hall et al., 2013](#)). In addition, psychological health research into FIFO employees has reported difficulties with adjustment ([Behr, 2012](#)), stigma associated with mental health, accessing necessary support and low help-seeking behaviours ([Henry et al., 2013](#)). Collectively, the findings highlight a need for better understanding the psychological wellbeing issues of FIFO mining workers and encouraging them to access relevant support.

The setting for this study was chosen deliberately. [Storey \(2008\)](#) claimed the mining industry in Western Australia “has most enthusiastically embraced” (p. 24) FIFO commute systems, evident from the increase in numbers of FIFO employees in Western Australia, from 4,220 employees in 1991 to 11,300 employees in 1999 and upwards of 60,000 employees in 2015 ([Australian Bureau of Statistics, 2016f](#); [Storey, 2008](#)). Such a dramatic uptake of FIFO workers raises questions about the effects on employees and whether this type of work regime is sustainable. The benefits versus costs of FIFO employment arrangements have been publicly debated in Australia over the past decade. In 2013, FIFO work practices were described as a “cancer of the bush” by Ron Yuryevich, the then Mayor of Kalgoorlie (a city of about 40,000 people located 600 km east of the state capital, Perth), due to perceived negative impacts on regional communities. However, FIFO has also been a source of rural economic and employment growth ([House of Representatives, 2013](#)). In Queensland, use of a 100% FIFO versus residential workforce was recently contested in a government-initiated inquiry ([Infrastructure Planning and Natural Resources Committee, 2015](#)). Since 10 per cent of Australia’s gross domestic product (GDP) is derived from the mining industry ([Australian Bureau of Statistics, 2018](#)), there are substantial economic implications linked to the overall success or failure of the FIFO work model. The prosperous Australian mining industry has undoubtedly fuelled numerous social, infrastructure and regional changes; however, the flow-on effects of FIFO employment remain largely unexamined.

The main point of departure of this thesis from previous research is its investigation of psychological wellbeing and associated help-seeking behaviours, as well as the working conditions of FIFO employees in the Australian mining industry. This chapter will briefly contextualise the study by outlining the key points and concepts with regard to mining industry travel or commute work, mental health and help seeking. It also presents the research objectives and questions, the research approach and methods, and the contribution of the study to the corpus of knowledge.

1.2 Mining Industry Commute Work

In the early 1900s, extracting natural resources was a high priority in a number of industrialised countries, such as Australia, Canada and Sweden ([La Croix, 1992](#)). In Australia, thousands of workers migrated to remote areas in search of gold and jobs. In addition to company towns, mines that tapped into large deposits also supported the growth of permanent mining settlements – over time they developed into regional centres themselves (e.g., Ballarat and Bendigo in Victoria, and Kalgoorlie and Port Hedland in WA). The long-term results were significant population growth and economic gain in what was then a rapidly developing Australia, and the country steadily became a recognised global mining hub ([La Croix, 1992](#); [Measham et al., 2013](#)).

FIFO mining work is a well-established and expanding form of work organisation in remote locations that are difficult to supply with local labour ([Storey, 2010](#)). In countries with sparsely distributed populations, such as Australia and Canada, the FIFO work system is particularly useful due to the long distances workers must travel to remote and transitory locations ([Storey, 2008, 2010](#)). In this thesis, the term “mining” is used broadly to include open cut or underground mining, quarrying, dredging, well operations or evaporation pans, recovery from tailings or ore dumps, and beneficiation activities (e.g., preparing, screening, washing and flotation), as well as other mine-site preparation work or mining activity (see [Australian Bureau of Statistics, 2008](#)).

Terms used to describe commute work vary between countries and contexts. For example, the term “long-distance labour commuting” (LDLC) is frequently used in North America and Canada ([Ryser, Markey, & Halseth, 2016](#)), while “fly-in, fly-out” is the more common vernacular in Australia. “Drive-in, drive-out” (DIDO) and “bus-in bus-out” (BIBO) refer to employees who reside a feasible distance from work to use land-vehicle transport. Since they return home each day, DIDO and BIBO do not experience the same conditions as FIFO employees, who take air transport and cover greater distances to/from their work.

[Mäkelä, Saarenpää, and McNulty \(2017\)](#) have previously described a multitude of different types of FIFO work, including international and interstate commutes; however, FIFO and DIDO employment arrangements are predominantly associated with the Australian mining industry. FIFO employment is usually organised on a roster system, whereby employees travel to their workplace for a number of days or weeks followed by a period of leave ([Henry et al., 2013](#); [Peetz et al., 2012](#)). Commonly, the employing organisation covers the costs associated with transport, accommodation, food and basic workplace services ([Storey, 2008](#)).

FIFO work in the mining industry is distinguished by roster systems, shift work and typically longer (e.g. 12-hour) days than other industries ([Australian Bureau of Statistics, 2016f](#)). Rosters vary between different occupations, locations, permanent employees, contractors and different operations. They can be “low compression”, such as six days at work and eight days at home, or “high compression”, three weeks at work and only one week at home ([Henry et al., 2013](#); [Meredith, Rush, & Robinson, 2014](#)). Some employees work on a “call-out” basis, while construction employees typically work longer rosters and for the duration of a particular project before being reassigned ([Storey, 2008](#)). This thesis uses the terms “employees” and “workers” interchangeably in reference to the FIFO mining workforce, since they include individuals in a range of standard, contracted and self-employment arrangements under the law.

1.3 Psychological Wellbeing and Help-Seeking of FIFO Workers

The most common mental health conditions in the general Australian working population are depression, substance misuse, anxiety disorders and work-related stress, often occurring together ([Henry & Crawford, 2005](#); [McTernan, Dollard, & LaMontagne, 2013](#)). In the work context, mental health has significant effects on individual performance and organisational outcomes, and represents important benefit and cost considerations, yet there is relatively little extant research that explores the mental health and help-seeking behaviours of the FIFO mining workforce. This lack of knowledge and insight was highlighted by federal parliamentary inquiries (see [House of Representatives, 2013](#)) in the two major mining states of Western Australia ([WA Education and Health Standing Committee \(final report\), 2015](#)) and Queensland ([Australian Mines & Metals Association Submission number 223, 2015](#)). Despite some conflicting results, there was overall support for an increased rate of psychological distress among FIFO mining employees ([Bowers et al., 2018](#); [Henry et al., 2013](#)). Nonetheless, further research is needed to examine the prevalence and different types of mental health problems in a large sample. This would help to

better identify the precursors affecting mental health and help-seeking in a FIFO context, and develop effective intervention and prevention strategies as well as appropriate supports.

Prior to commencing work in the mining industry, [Behr \(2012\)](#) found most FIFO mining employees worked in an urban context. While their FIFO roles were similar to previously held positions (e.g., engineering or construction roles), working in remote areas of WA was a substantially different context ([Behr, 2012](#)), and in addition to extended periods of time spent with other employees, can lead to increased bullying and interpersonal problems ([Carter & Kaczmarek, 2009](#); [Miller, 2014](#)). In addition, the FIFO workplace culture is inclined towards “macho” perceptions of expressions of emotion and provides little sympathy for individuals experiencing difficulties ([Pirota, 2009](#); [Wicks, 2002](#)). It is therefore likely a combination of factors that creates problems for some FIFO workers to adjust to their roles in an employment context that requires a significant degree of adjustment ([Behr, 2012](#); [Vojnovic et al., 2014](#)).

Some scholars have made a connection between difficulties adjusting to FIFO work arrangements and mental health strain ([Bowers et al., 2018](#); [Henry et al., 2013](#)); however, this has never been measured. Frequent issues raised by previous studies include feelings of isolation and loneliness, substance misuse, sleep problems, limited social networks, a sense of hopelessness, and a perception of stigma associated with seeking support ([Henry et al., 2013](#); [Miller, 2014](#)). How workers engage with help-seeking behaviours in response to such challenges requires urgent further investigation.

In the WA mining industry, perceptions of negative career impacts and confidentiality concerns have contributed to a low adoption of Employee Assistance Program (EAP) services ([Henry et al., 2013](#)). For employees, disclosing mental health diagnoses and prescribed medication to their employers present both real and perceived conflicts. In some circumstances, there are concerns about being discriminated against by management ([Henry et al., 2013](#)). Anecdotal reports also indicate that FIFO workers are reluctant to take prescribed medication for mental health conditions for fear of detection in regular drug tests performed in many mining workplaces. Positive drug testing invariably leads to loss of employment.

Empirical evidence has identified stigma as a key barrier to employee help-seeking ([Wade et al., 2015](#)), yet how it affects FIFO workers remains poorly understood ([Bowers et al., 2018](#)). Stigma around mental disorders is undoubtedly widespread ([Heath et al., 2018](#); [Wade et al., 2015](#)), and in a work context, can have negative career implications for promotion and termination, as well as being viewed as incompetent and a risk to others ([Stuart, 2006](#)). Stigma is a strong predictor of help-seeking behaviour, and because it might exert a strong influence on social networks,

employees can affect one another's perceptions of mental health and help-seeking ([Wade et al., 2015](#)). Organisations that value emotional strength (e.g., the armed forces) have been shown to exacerbate negative beliefs about mental health treatment ([Britt et al., 2008](#)) – reports have even highlighted some similarities between military and FIFO employees ([Velandar et al., 2010](#)) insofar as beliefs about mental health and help-seeking are concerned.

While physical health and safety practices have become highly sophisticated in the mining industry, an appreciation of employee psychological health and safety is still emerging ([Bowers et al., 2018](#); [McTernan et al., 2016b](#)). High levels of mental health in the workforce, gained through increased work engagement, motivation and extra-role activities, ([Cameron, 2012](#); [Luthans, Youssef, & Avolio, 2007](#)) can generate enormous organisational benefits. Conversely, poor mental health can adversely influence organisational outcomes through reduced productivity, diminished performance and increased insurance claims for mental stress ([Law et al., 2011](#)). This is not an exhaustive list – further benefits and adverse outcomes are discussed in Chapters 3 and 7.

The above brief discussion contains implications for better understanding FIFO workers' mental health and help-seeking behaviours, and for incorporating prevention strategies into company policies, practices and procedures to enable positive, remedial action. It has the potential to drive systematic changes in the Australian mining industry and improve the mental health of FIFO workers. In turn, we anticipate a positive impact on employees' quality of life, and ultimately, on company profitability.

1.4 Research Questions and Objectives

Assessing the influence of prevalent mental health concerns in the FIFO mining workforce is important for a number of reasons. First, adjustment has been identified as an important variable ([Behr, 2012](#)), yet its effects on mental health have not been tested. Second, stigma and help-seeking have been established as important factors ([Henry et al., 2013](#)), although how these influence mental health has not been empirically assessed. Furthermore, the influences on the help-seeking behaviours of the FIFO mining workforce are still largely unexplained. Help-seeking behaviour is not a global measure, and the ways in which employees respond to adversity depend on the problem at hand. Importantly, mental health benchmarks in the WA mining industry are undeveloped ([Dollard, Opie, et al., 2012](#)) and to date there has been little empirical examination of how individual differences influence the mental health of FIFO mining workers. In summary, there is little understanding about the prevalence of psychological wellbeing, help-seeking

behaviours and antecedent factors, so best-practice solutions are yet to be developed for the benefit of all FIFO stakeholders.

The current study gathered and analysed empirical survey data to better understand the incidence of mental health and help-seeking behaviours of the Australian FIFO mining industry workforce. The research objectives were to gauge the extent to which FIFO mining employees experienced psychological wellbeing; to examine the interrelationships between different dimensions of psychological wellbeing and their influence on help-seeking behaviour; and to examine the influence of FIFO working conditions on the different dimensions of psychological wellbeing and help-seeking behaviour.

To provide specific guidance for the research objectives, the study sought to address the following three questions:

- To what extent are self-reported symptoms of depression, anxiety and stress experienced by FIFO mining employees and how do these rates vary under different working conditions?
- In what ways are adjustment, psychological wellbeing, stigma and help-seeking among FIFO mining employees related?
- What is the influence of working conditions on the relationships between adjustment, psychological wellbeing, stigma and help-seeking among FIFO mining employees?

1.5 Research and Theoretical Approach

The study is grounded in the interface between work and psychology and situated in the field of occupational health psychology. Internal processes determine whether employees are aware of mental health symptoms, how they navigate available supports and whether or not they will decide to disclose their experiences ([Rickwood & Thomas, 2012](#)). Similarly, internal beliefs about help-seeking processes will guide employees' intentions and decisions about seeking help for a known or perceived mental health problem, including their attitudes towards the behaviour (e.g., calling a Helpline or booking a counselling appointment), perceived social pressure (e.g., stigma) and their self-belief in successfully performing the action, referred to as self-efficacy ([Ajzen, 2011](#)). [Ajzen \(1991\)](#) developed the meta-level Theory of Planned Behaviour (TPB), a highly regarded and extensively supported framework in the academic literature. TPB has direct relevance for help-seeking behaviour, particularly the role of employees' social cohorts ([Dawkins](#)

[& Frass, 2005](#)) and safety issues ([Fogarty & Shaw, 2010](#)), and was therefore deemed suitable for explaining why some FIFO workers engaged in help-seeking behaviours and others did not.

Help-seeking is defined as “an adaptive coping process that is the attempt to obtain external assistance to deal with a mental health concern” [Rickwood and Thomas \(2012, p. 180\)](#). [Rickwood et al.'s \(2005\)](#) Process Theory of Help-Seeking complements TPB through the addition of four intra-personal processes: (1) symptom awareness; (2) expression of symptoms and the need for support; (3) considering resource availability and a willingness to disclose a mental health concern; and (4) seeking help ([Rickwood et al., 2005, p. 8](#)). In this study, the Process Theory of Help-Seeking was applied to the FIFO mining employment context and used to explore how barriers (e.g., access to services, attitudes) may deter FIFO employees from accessing support that cannot be understood through TPB alone. Theoretically, the study contributes insights on the relationships between adjustment ([Behr, 2012](#); [Black & Stephens, 1989](#)), psychological wellbeing and distress ([Clark & Watson, 1991](#)), stigma ([Corrigan, 2004](#); [Vogel, Wade, & Ascheman, 2009](#)), help-seeking ([Rickwood et al., 2005](#); [Rickwood & Thomas, 2012](#)) and working conditions ([Dollard & Bakker, 2010](#); [Dollard et al., 2007](#)).

[Demerouti et al. \(2001\)](#) developed the meta-level JD-R model for understanding employee wellbeing and performance ([Demerouti & Bakker, 2006](#)). The model accounts for organisational working conditions in the form of demands and resources. Research undertaken in an environment that facilitated and protected psychological wellbeing/distress, has implications for work health and safety decisions and duty of care obligations for resource companies ([Dollard et al., 2007](#); [McTernan et al., 2013](#)).

Both the theory of TPB ([Ajzen, 2011](#)) and the Process Theory of Help-Seeking ([Rickwood et al., 2005](#)) explain internal phenomena. However, TPB has an inherent weakness in its lack of explanatory power for the gap between an individual's intent and subsequent action and does not account for organisational context because it is essentially an internal theory. The Process Theory of Help-Seeking explains how TPB factors influence employee beliefs, perceived social pressure, self-efficacy and help-seeking behaviours through symptom awareness, navigating available supports, choosing whether or not to disclose and seek help. The JD-R model suggest that organisational factors influence internal responses (e.g., wellbeing, motivation, engagement) but fails to account for internal demands and resources. For this reason, the study drew from an integrated TPB and Process Theory of Help-Seeking framework, augmented by the JD-R model, to explain internal and external phenomena, respectively. The research approach sought to extend theoretical understanding of both theories and the JD-R model in a FIFO employment context.

1.6 Research Methods

The study entailed a quantitative analysis of 629 participants from the Australian FIFO mining workforce, collected between July 2014 and January 2015, and employed a correlational research design (*note*: the delay in thesis completion from the time of data collection to submission coincides with the researcher changing from full-time to part-time enrolment status). Structural Equation Modelling (SEM) was used to assess the measurement and structural models, and is a popular methodology for non-experimental research that is particularly suitable for examining a variety of research health and psychology data ([Lowry & Gaskin, 2014](#); [Suhr, 2006](#)). The psychological processes of adjustment, wellbeing/distress, stigma and help-seeking, as well as the influence of FIFO working conditions on the relationships between these processes, were analysed.

1.7 Thesis Contribution

This thesis intends to make three important contributions. First, it provides information on the gap between the psychological wellbeing needs of FIFO workers and their use of services, as established in prior research (e.g. [Rickwood et al., 2005](#); [Wilson & Deane, 2010a](#)). The findings will therefore contribute new insights by shedding light on the underlying reasons for Australian FIFO workers' responses to symptoms of psychological distress.

Second, the examination of mental health dimensions has practical implications for developing strategies and influencing public policy in this area. The research prioritises mental health in the workplace in a similar way to WHS, at a time when information on work-related mental health risks, hazards and injuries is still emerging in Australia. Mining companies have responded to WHS risks (e.g., managing fatigue and preventing bullying) by developing a multitude of safety policies, practices and procedures, with oversight provided by organisations such as Safe Work Australia that set and regulate industry standards. Over the last few decades, the social and economic costs of WHS hazards and injuries have been well established and refined. This thesis will add to our understanding of psychosocial hazards and injury, viewed in a similar way to WHS, and looks at future implications for establishing and regulating industry standards.

Third, the study will contribute novel insights into how and why FIFO job demands affect psychological wellbeing and help-seeking, and brings into sharper focus the responses of FIFO

workers to their working conditions. The information obtained and analysed will enable deeper understanding of the reasons for mental health strain in the FIFO workforce.

1.8 Thesis Outline

This thesis contains seven chapters. Chapter 2 describes the Australian mining industry and sketches the background, illustrating the importance of the industry for its contribution to Australian federal and state revenues and employment. It covers the shift away from the “company town” model to FIFO working arrangements, and significant changes in the mining industry over the last two decades. In Australia, recent parliamentary inquiries document long-suspected links between FIFO working conditions and a higher prevalence of certain mental health conditions among FIFO workers. The chapter concludes with a discussion about the lack of empirical research into the effects of FIFO employment on mental health.

Chapter 3 then presents the dominant themes in previous mental health research on the FIFO workforce, and outlines the key themes that emerged in this study, viz., isolation, loneliness, bullying and stigma. The literature shows that the mental health of FIFO workers is not only strained, but they commonly do not access mental health support; the reasons for this are discussed. Next, barriers to help-seeking in the FIFO context are considered, as well as the role of various structural barriers (e.g., time to access supports) and attitudinal barriers (e.g., employees being viewed by others’ as weak).

Chapter 4 presents the conceptual framework and underpinning theory, comprised of TPB complemented by the Process Theory of Help-Seeking. Further understanding of FIFO employee mental health and help-seeking is provided by the JDR model that indicate how working conditions can impair both mental health and help-seeking. The chapter then focuses on different mental health and help-seeking dimensions and a series of hypotheses are outlined, along with a conceptual model.

Chapter 5 then describes the methodology, including the sample selection and representativeness. The participants (N = 629) comprised employees working under FIFO arrangements in various mining locations around Western Australia (WA). They responded to a survey that was delivered in both online and hard-copy formats over a six-month period. The chapter also analyses the measures used and provides justification for the research design and analytical techniques.

Chapter 6 summarises the results. The measurement and structural models are analysed and the conceptual model compared to the empirical models. The results show an inverse relationship between mental health and help-seeking behaviour, indicating that FIFO workers who experience psychological distress are unlikely to access support. The findings also highlight stigma as a major barrier to accessing support, and show a significant relationship between certain working conditions and psychological distress.

Chapter 7 presents an overall discussion of the research findings. The theoretical implications of the research are outlined, and the limitations and future research directions described. The chapter concludes with a series of public policy recommendations that can be used to identify and trial practical strategies for alleviating mental health problems and promoting help-seeking behaviours among FIFO workers.

1.9 Conclusion

FIFO working arrangements in the Australian mining sector appear to exacerbate psychological distress, yet the FIFO mining workforce does not adequately access support. In Australia, this has been recognised as a public policy issue and precipitated the current research to better understand the prevalence of common mental health issues and associated help-seeking behaviours. Together with heightened concerns about the mental health of FIFO employees, anecdotal reports of increased prevalence in this population group underscored the need for empirical assessment with a valid measure of mental health symptoms. A key research objective of this thesis was aimed at evaluating the levels and extent of the various mental health dimensions.

In summary, the current study reports on the extent to which a large sample of 629 FIFO mining employees experienced psychological distress. The research examined the interrelationships between different dimensions of mental health, including the influence of FIFO working conditions, by building on previous studies to provide answers for identified gaps in our knowledge. Key theoretical contributions include the integration of TPB and the Process Theory of Help-Seeking, and expansion of the JD-R model to include new variables. The dimensions of psychological wellbeing and help-seeking examined are expected to inform practical strategies and influence public policy, particularly since the mental health of Australian FIFO workers raises significant community concerns and has broader economic and public policy implications.

The next chapter will outline important drivers in the context of the Australian mining industry.

Chapter 2 - Industry Context

2.1 Introduction

The previous chapter described the research setting, the research rationale and objectives, and briefly outlined the theoretical framing, methodological approach and thesis structure. To clarify the thesis objectives, it was necessary to understand the context and working conditions in which FIFO employees in Australia find themselves. Therefore, this chapter will discuss key aspects of the global and Australian mining industry, including the economic and labour contributions of the sector and common FIFO employment arrangements. Important findings from Australian federal (national) and state parliamentary inquiries shine further light on the growing significance of FIFO working arrangements and the far-reaching implications of what has become an important public policy issue.

2.2 Mining: A Global Industry

A number of factors differentiate the mining industry from others, including the maturity of the sector, the long time frames associated with capital-intensive, large-scale operations and the ability of many mining companies to operate on a global basis ([Halland et al., 2015](#)). Multinational enterprises (MNEs) dominate the mining industry; some of them are very large. [Shapiro, Hobdari, and Oh \(2018\)](#) reported that 16 out of the 100 largest MNEs in the world were mining companies (e.g., Vale, Petronas) ([United National Conference on Trade and Development, 2017](#)). Many mining industry MNEs operate in and across multiple countries. In Australia, BHP operates in WA, Queensland, New South Wales and South Australia, with a focus on copper, iron ore and nickel. Globally, BHP – formally known as BHP Billiton until 2017 – operates mines in a range of countries, including Chile, Peru, USA, Colombia and Brazil ([BHP Billiton, 2016](#)). Spreading production over multiple countries and sites could be both necessary, since resources must be extracted where they occur naturally, and a risk-reducing strategy for mitigating against environmental degradation and resource exhaustion.

The reasons why there are relatively few, yet very large global mining companies include the capital-intensive nature of fully developing extraction projects over long periods of time, and exposure to significant risk once mining operations are scaled up causes significant barriers to entry for new companies seeking to establish viable operations. Increasingly, mining MNEs

originate from emerging market economies, often with heterogeneous ownership structures and varying degrees of state ownership ([Shapiro et al., 2018](#)). As a global industry, political tensions also drive change. For example, the European Union (EU) emphasised the strategic importance of the mining industry and deemed its reliance on imports of minerals from other parts of the world problematic ([Commission of the European Communities, 2008](#)). Not only are mining MNEs frequently exposed to political risks (e.g., threats of renegotiating contracts and royalty terms), there are also social risks (e.g., conflicts within communities, particularly indigenous peoples, NGOs and other stakeholders) ([Shapiro et al., 2018](#)). These tensions and risks place pressure on public policy interests, commodity prices and demands for resources, and therefore have flow-on effects for FIFO labour requirements.

Global proliferation of mining has resulted in a variety of FIFO work practices and employment conditions. The largest FIFO workforces tend to be in sparsely populated mining locations that are difficult to access, such as Canada, Sweden, Australia and Chile ([Shapiro et al., 2018](#); [Storey, 2010](#)). Canada, for example, has a strong tradition of using a mobile workforce since the 1960s for its remote mining operations ([Shrimpton & Storey, 1996](#)). In the Canadian context, mining often occurs in extremely cold environments and trade union involvement is an accepted part of the workplace culture ([Buchanan & Marques, 2018](#)). Mining in Australia is unique in two ways; environmentally (hot climate with desert-like conditions in places like WA and Queensland) ([Maté & Oosthuizen, 2012](#)) and politically, in terms of a declining unionised workforce ([Bice, 2014](#)).

2.3 Australian Mining

Due to its geographic location on both the Pacific and Indian Oceans, Australia is well placed to export minerals and energy to neighbouring countries such as China, Thailand and Malaysia providing substantial economic benefits. Historically, the first mining operations in Australia were for gold and used a mainly residential workforce as described in Chapter 1. However, the industry has since become more sophisticated and diversified ([La Croix, 1992](#); [Measham et al., 2013](#)). In addition to gold, the most commonly mined Australian resources in 2016 were iron ore, oil and gas, predominantly extracted from locations in WA and Queensland, followed by New South Wales ([Australian Bureau of Statistics, 2016b, 2016d](#)). Between 2003 and 2008, China's substantial economic growth accelerated a resources boom in Australia with a large demand for iron ore. This resources boom was the most sustained period of growth since the

Second World War ([Humphreys, 2010](#)). As demand increased, the notion of a “super cycle” emerged ([Tonts et al., 2016](#)), and in response, mining companies substantially scaled up operations, with heavy reliance on a FIFO workforce and specialised skilled labour from overseas ([Bahn et al., 2012](#)). The longevity of the boom sustained this “super cycle” until metal prices weakened in 2008 ([Tonts et al., 2016](#)), largely attributed to an imbalance in demand and supply of iron ore that impacted the cost of both manufactured goods and mineral commodities ([Humphreys, 2010](#); [Tonts et al., 2016](#)). The culmination of these factors was a decline in the Australian mining industry ([Humphreys, 2010](#)), and the boom that started in 2003 had ended by 2013.

Mining exports continued to slow ([Australian Bureau of Statistics, 2016b](#)) in the ensuing years. While there are currently challenging market conditions for Australia’s resource and energy exports, the medium and long-term forecasts remain relatively optimistic. Due to increasing urbanisation and expanding manufacturing capacity in Asian markets, the demand for commodities is anticipated to increase once again, with mining MNEs in Australia well placed to benefit ([Gibbons et al., 2016 March](#); [United National Conference on Trade and Development, 2017](#)).

2.4 Economic Contribution

The Australian mining industry contributes around 10 per cent of the national gross domestic product (GDP) ([Australian Bureau of Statistics, 2014, 2016c](#)) and employs approximately 221,000 people ([Australian Bureau of Statistics, 2016d](#); [Department of Employment, 2018b](#)). As a proportion of the total labour force, this figure is well beyond its relative contribution to the national GDP. The most recent mining boom (mid 2000 - 2013) had enormous benefits for Australia in economic terms, largely driven by emerging economies requiring large quantities of raw minerals and energy for manufacturing and urbanisation. Australian commodity prices increased substantially, followed by sustained investment in the resources and energy sectors. Australia’s terms of trade peaked in September 2011, the highest in 140 years ([Gibbons et al., 2016 March](#)). At the end of the boom in 2013, investment had declined due to a slowdown of precipitating forces and weakening trade terms, and the number of mining projects reduced significantly. An assessment of the mining industry by export subsector using ABS data ([Australian Bureau of Statistics, 2016c](#)) shows numerous peaks and troughs for export materials between 2006 to 2017, as displayed in Figure 2.1.

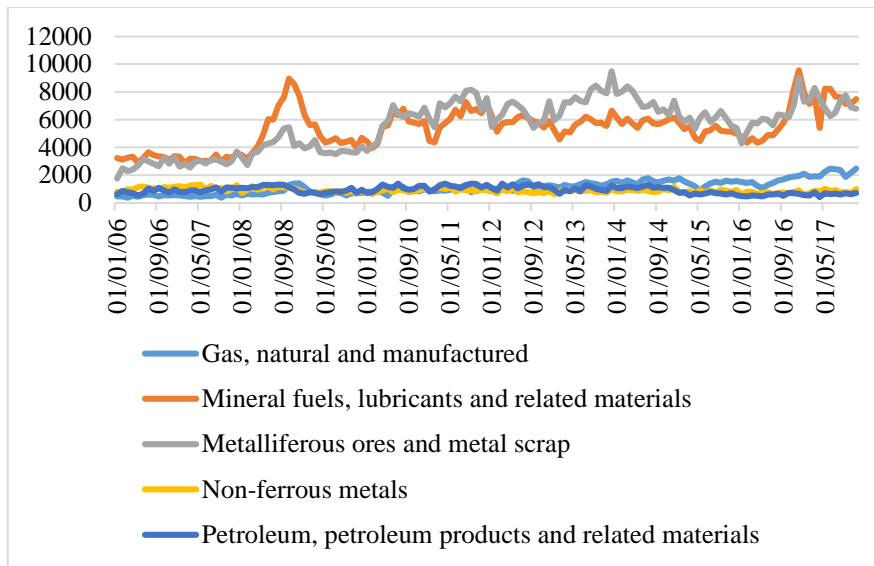


Figure 2.1 Australian Mining Industry Exports 2006 – 2017

Internationally, and in Australia, there has been ongoing debate about the mining industry as a “cure or curse” (Brueckner et al., 2014). The “cure” debate cites the positive impact of mining on incomes, communication access, housing affordability, education and employment opportunities in regional and remote communities (Basu et al., 2015; Hajkowicz, Heyenga, & Moffat, 2011). The substantial contribution of the mining industry to employment and the health of the economy is important for Australia’s ongoing growth and development. O’Faircheallaigh (2006) has claimed FIFO employment arrangements were originally a potentially valuable part of government affirmative action programs that sought to increase the participation of indigenous peoples in resources development. Benefits for indigenous workers included participating in resource-based activities while maintaining elements of their traditional lifestyle (e.g., location, extended time at home) and earning an income. However, factors such as indigenous title, land claim agreements, statutory requirements, government policy and impact benefit agreements have become impediments for major resource projects (Storey, 2008).

The “curse” debate cites a range of negative effects of mining activities on environmental and social conditions (Brueckner et al., 2014). Social inequality in rural regions in relation to housing prices, indigenous homelessness and employment opportunities are key criticisms (McKenzie et al., 2009), and are partly a fallout from increased housing prices in mining towns to the point where locals could no longer afford to live there. There have been a number of conflicts between indigenous people and mining developments, frequently resulting in opposition to development and delays to constructing mining projects, as well as abandoning projects altogether at substantial financial losses. The undue influence of large multinational organisations on

Australian political decisions and questions about a social license to operate have also been raised ([Bice, 2014](#); [Brueckner et al., 2014](#)). In addition, the economic impact on “host communities” has been disappointing, since much of the income earned has not been spent in the regions where they were earned ([McKenzie et al., 2009](#); [Storey, 2010](#)). These phenomena have contributed to a wider perception that the mining industry has split the state of Western Australia into two “worlds”: one, the state capital of Perth where mining company executives and government is located, and the other, a remote frontier-like environment with sparsely-settled communities that receive relatively little ([Vojnovic, 2015](#)).

2.5 Labour Market Trends

The cyclical nature of mining juxtaposed with the global supply and demand for natural resources directly influence the size of the Australian FIFO workforce. The mining life cycle is characterised by four main phases: exploration for minerals; mine construction; an operational phase where resources are extracted; and once the bulk of the minerals are depleted, mine decommissioning. Each of these stages requires different skills and workforces. The need for labour is highest during the construction phase, followed by the operational phase, with the exploration and decommissioning stages require relatively less labour. Figure 2.2 illustrates the pattern of employment needs over the four stages of the mining life cycle.

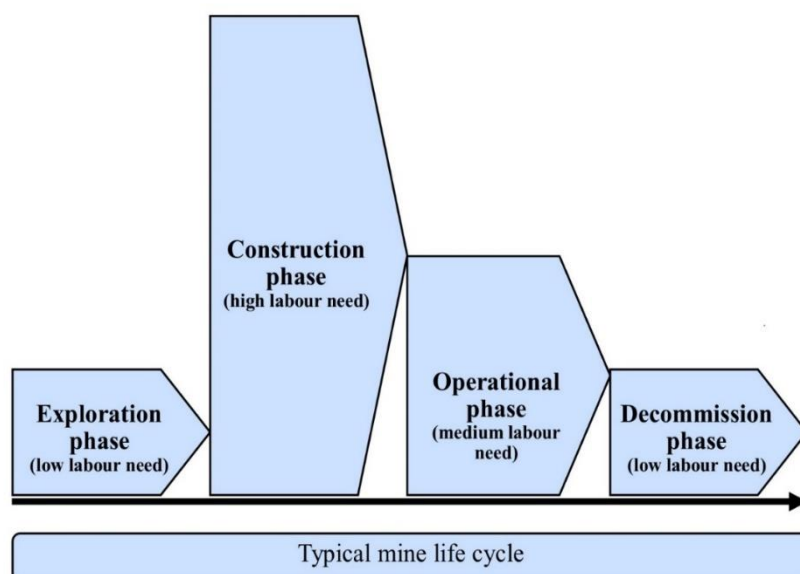


Figure 2.2 Typical Mining Cycle and Associated Employment Needs

Western Australia, Queensland and New South Wales collectively account for nearly 88 per cent of employment in the Australian mining industry ([Department of Employment, 2014](#)). [Brown et al. \(2014\)](#) has also reported that at least 50 per cent of the WA mining workforce was employed under FIFO arrangements. In terms of employment at the time of data collection for this study in 2014 and 2015, the mining industry in WA contributed 43 per cent, followed by Queensland at 29 per cent and New South Wales at 17 per cent ([Australian Bureau of Statistics, 2013](#)).

The WA Chamber of Minerals and Energy (or CME) predicted the size of the residential mining workforce would decrease by 2020, partly due to the workforce transitioning to FIFO roles ([Chamber of Minerals and Energy, 2014](#)). The CME reported that the anticipated changes in employment would largely be driven by a reduction in construction roles for FIFO workers who made up over 80 per cent of the construction workforce. The FIFO construction workforce was predicted to decrease between 2014 and 2020, while FIFO positions in operational activities were expected to increase, particularly in the Pilbara region of WA ([Chamber of Minerals and Energy, 2014](#)). Importantly, the WA mining industry is expected to continue its reliance on a large FIFO workforce in the foreseeable future.

In terms of wages and salaries, during 2014 and 2015 the mining industry in WA accounted for 49 per cent of the national total (\$10.3b) of mining remuneration. This was followed by Queensland with 26 per cent (\$5.5b) and New South Wales with 15 per cent of the national total (\$3.2b), while the remaining states jointly accounted for just 10 per cent. In relation to total sales and service income, WA has remained the largest state, contributing 60 per cent of income, more than three times the next state, Queensland, at 19 per cent ([Australian Bureau of Statistics, 2016d](#)). The economic contribution to mining industry employment, wages and salaries, and sales and service income are displayed in Figure 2.3.

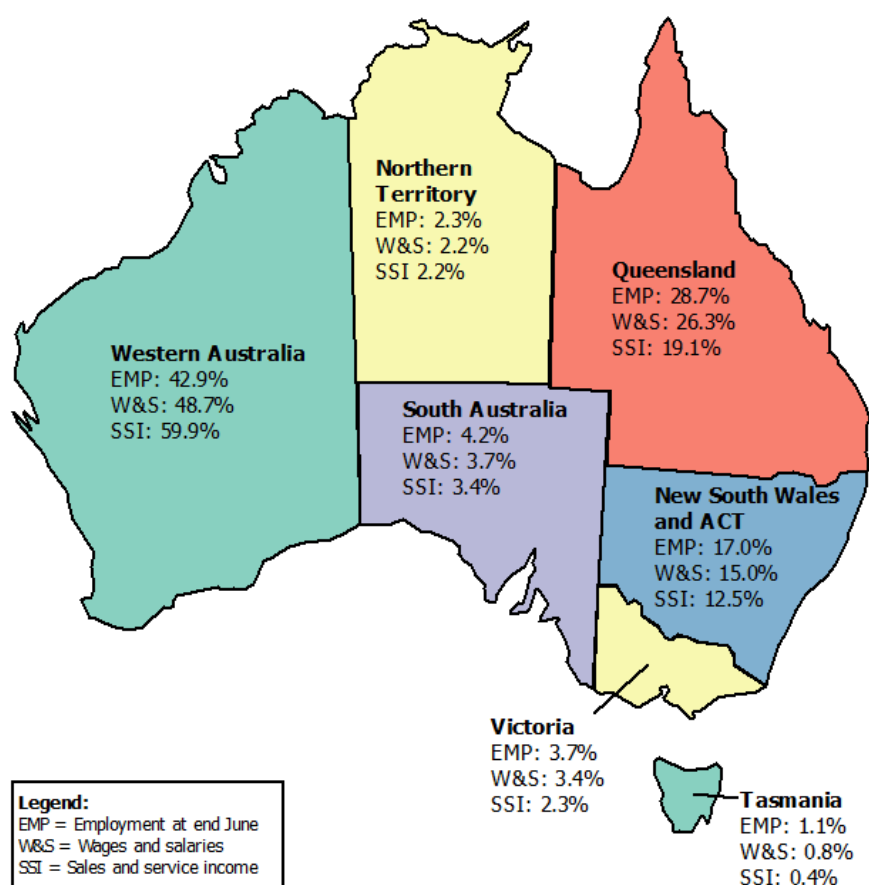


Figure 2.3 Map of Mining Industry in Australia 2016. Source: [Australian Bureau of Statistics \(2016d\)](#).

Beach, Brereton, and Cliff (2003) report the estimated annual cost of a mine with a 300-strong FIFO workforce at \$2.8 million. The National Resources Sector Employment Taskforce (NRSET) (2010) appointed by the Australian Federal Government advised that turnover rates in the mining industry were high compared to other industries. Beach et al. (2003) found FIFO employee turnover rates across seven mines varied between 21 and 28 per cent, consistent with other claims citing the attrition rate of FIFO workers at approximately 30 per cent a year (double that of non-FIFO mining employees) (Carrington & McIntosh, 2013, p. 133). Trend analysis predicted an average gross replacement rate (employees that leave the sector or retire) of 10 per cent a year, with higher turnover rates among blue-collar workers than professionals (Carrington & McIntosh, 2013; National Resources Sector Employment Taskforce (NRSET), 2010). Brown et al. (2014) identified several factors that contribute to FIFO workforce turnover, including family circumstances, organisational culture and whether employees perceived their supervisors and managers as supportive. Other significant factors were FIFO employees' satisfaction with their roster and whether their roster fitted with their lifestyle (Brown et al., 2014, p. 129). The relatively

high turnover rate in the mining sector places strain on companies to attract and retain employees, and entails using more complex recruitment strategies, such as career options, company benefits and leadership opportunities ([Brown et al., 2014](#)). Remuneration also appears to play an important role. In 2016, the average weekly earnings of full-time mining employees was A\$2,494, substantially higher than any other industry (the median across all industries was then \$1,231) ([Australian Bureau of Statistics, 2016a](#)).

2.6 The FIFO Employment Arrangement

The sustainability and effects of FIFO work practices have long been questioned, most notably by [Bell and Head \(1997\)](#), particularly in view of the far-reaching impacts on shaping local communities, unions and values, as well as the influence of these factors on FIFO workers ([Ellem, 2017](#)). The forces that drive increased use of FIFO workers by mining organisations have changed over time, depending on fluctuating commodity prices as noted above, employee preferences, labour supply constraints and changing regulations ([Storey, 2008](#)). For example, [Storey \(2008, p. 26\)](#) observed that the 1969 National Environmental Protection Act (NEPA), initially passed in the United States, instigated a global change in how proposed mining “projects were evaluated for their potential environmental (including social and economic) impacts”. Such regulation was subsequently introduced in Australia in 1974, increasing infrastructure requirements and associated costs for mining organisations ([McGrath, 1985](#); [Storey, 2008](#)). A “normalisation” program was implemented in Australia in the early 1980s, resulting in the conversion of “company towns” to “open towns” and the establishment of local operational governments. Further, accommodation and service expectations significantly added to the cost of community development ([McGrath, 1985](#); [Storey, 2008](#)). At that time, FIFO employment arrangements were increasingly being adopted ([Bell & Head, 1997](#); [McGrath, 1985](#)) because it allowed organisations to more effectively recruit and retain skilled staff ([McKenzie, 2010](#)). However, FIFO employees were not spending the money they earned in the towns where they worked, causing resentment from the locals and income losses for many resource towns ([McKenzie et al., 2009](#)). Accommodating FIFO employees in the local community or in purpose-built camps has been a matter of contention. On the one hand, accommodating the workforce in the local community may contribute to the economic development of the region ([WA Education and Health Standing Committee \(final report\), 2015](#)), but on the other hand, FIFO mining employees reportedly prefer the option of separate “camp-style” accommodation ([Storey, 2008](#)).

Labour supply and preferences have influenced the decisions of organisations to wholly or partially shift from residential workforces to FIFO-type operations (e.g., Kalgoorlie in WA). Labour shortages during the 2003-2013 mining boom precipitated an increase in FIFO employees, most markedly in construction roles, as a number of new mines entered the construction phase. The demand for highly educated employees, such as specialist engineers, remains high, but there are insufficient university graduates who possess the required skills to fill these roles ([Bahn, 2014](#); [Storey, 2008](#)). The implications are that companies need to continue attracting and retaining employees by meeting the salary expectations and preferred working arrangements of highly skilled workers, while those in labour and construction roles are subjected to mounting competition and declining work conditions ([Bahn, 2014](#)).

Significant growth in regional and remote locations further increased the reliance of mining companies on FIFO workforces ([Henry et al., 2013](#)). Typically, FIFO employees reside in large urban centres, such as Perth or Brisbane, and fly to their work sites on regular, fixed schedules, where they reside in purpose-built accommodation camps close to the extraction location ([Henry et al., 2013](#)). Changed industry conditions has led to growing numbers of employees engaging in less secure and more flexible forms of employment ([Carrington & McIntosh, 2013](#)).

It is not surprising that the transport needs of the FIFO workforce and freight loads within WA and Queensland propelled a significant increase in airline services ([Baker & Donnet, 2012](#)). Regional and national airlines expanded their operations to the mining industry by including flights to privately-owned airfields within WA, where commute times vary between one and four hours, and longer if employees reside interstate or overseas, such as New Zealand. With many FIFO rosters typically comprising two weeks at work and one week off work, totalling approximately 48 flights a year, passenger movements surged in 2017 from Perth airport to mining locations such as Karratha (37,933 monthly passengers) and Port Hedland (30,230 monthly passengers) ([Department of Infrastructure and Regional Development, 2017](#)). Airports and infrastructure in Perth and elsewhere underwent major renovations to cater for the increased traffic ([Tonts et al., 2016](#)). Common destinations in WA for the FIFO mining workforce are depicted in Figure 2.4.

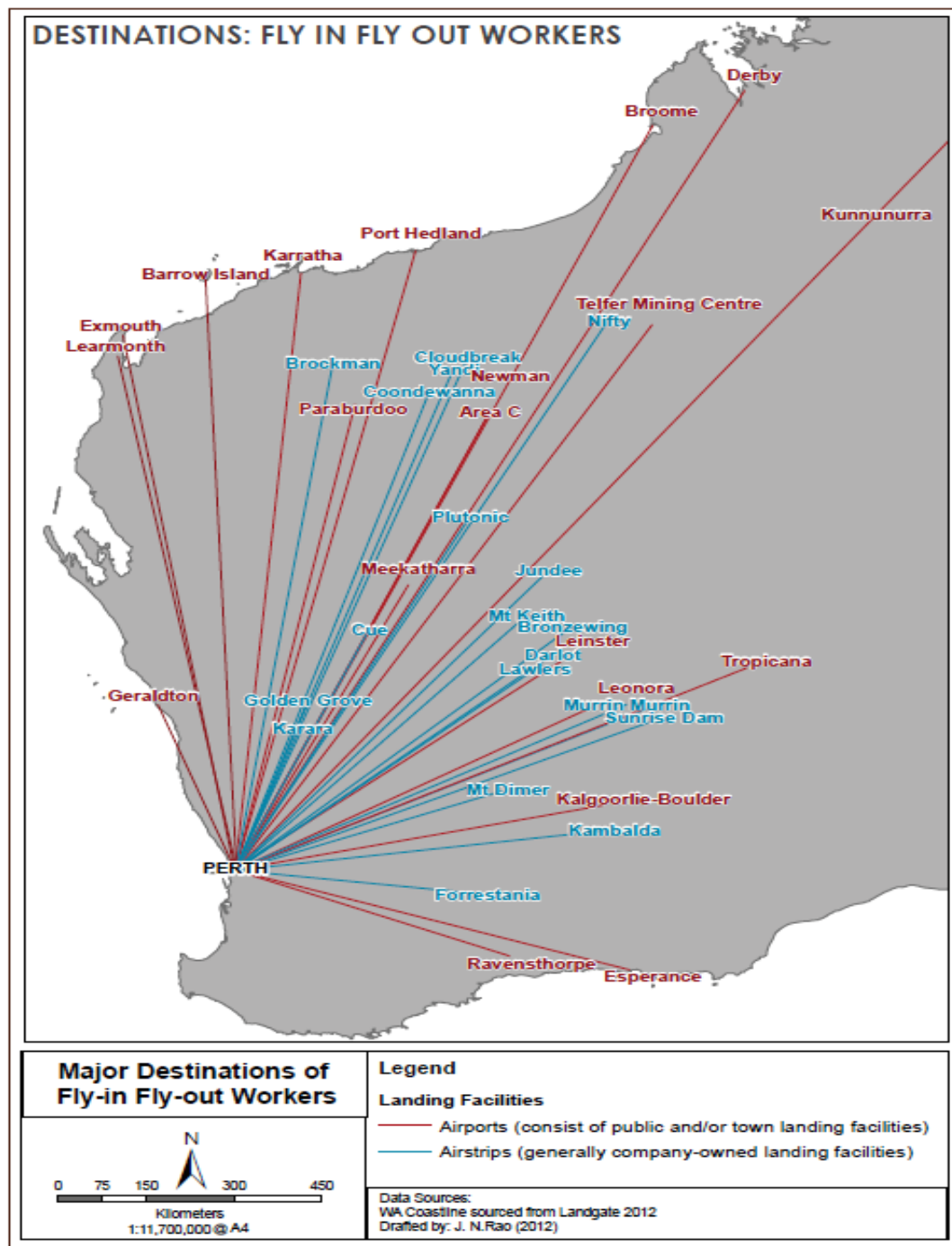


Figure 2.4 Map of FIFO Destinations in WA. Sourced from [Huddleston, Huddleston, and Tonts \(2012\)](#). Image originally from Landgate, 2012.

The demands of the FIFO labour force resulted in a financially well-compensated sector (Bahn et al., 2012), sparking reference to FIFO workers as “cashed-up bogans” (Pini, McDonald, & Mayes, 2012) an emerging social class in Australian society with relatively low levels of formal education and high incomes. The term “bogan” is a derogatory term used in Australia to refer to low-status, unsophisticated people. Comparable terms in other national contexts might be are “red-

neck” and “white trash”, for example. The opportunity to provide a financially secure future for their families was cited by Henry et al. (2013, p. 31) as a key motivator for undertaking FIFO employment. Henry and her colleagues found high financial remuneration was often used by FIFO workers to justify lengthy periods of time spent away from family and friends.

The Henry et al., (2013) study also showed that many FIFO workers viewed their roles as a temporary means of achieving their financial goals, such as paying off mortgages, vehicle ownership and so on, and did not intend to remain a FIFO worker for the long-term. However, trade unions and various submissions to the WA parliamentary inquiry (see Section 2.7) highlighted a recurring theme of “golden handcuffs”, whereby FIFO workers both “overspend and accumulate debt to the point where continuing in FIFO is the only way to manage financially” ([WA Education and Health Standing Committee \(final report\), 2015, p. 80](#)). In other words, they became financially “locked in” and committed to FIFO work; and many were unable to leave for lower paid jobs outside the mining industry. The situation was arguably compounded by a lack of financial literacy and education among the FIFO mining workforce.

The changing arrangements and workforce circumstances in Australia, such as the move away from “company towns” to FIFO models, have had other ramifications. Carrington and McIntosh (2013, pp. 64-66), for example, placed the influences on FIFO working arrangements into three categories: (a) broader external/industry forces; (b) factors within the workplace; and (c) associated lifestyle effects. Overlaps between these categories are displayed in Table 2.2, where the extent of the influence is illustrated by a scale of one star (indicating low level influence), two stars (medium influence) and three stars (high influence) ([Carrington & McIntosh, 2013](#)). An overview of broader external/industry forces indicates that both workplace factors and lifestyle effects of FIFO working arrangements have complex causes and consequences.

Table 2.2 *Extent of Influences on the Changing FIFO Workforce*

Changing arrangements and workforce circumstances	External/ industry	Workplace	Lifestyle
Elevated psychosocial workloads lead to many employees facing mental and physical demands.		***	***
Substantial increase in employee numbers since the mid-2000s.	***		
Two-thirds of the workforce are in labouring/trade and transport roles.	***		
Long operational hours (12-hour shifts) have become the norm.	**	***	*
Increased flexibility to allow for adjustment in production demands, quality of camp accommodation and intensifying organisational demands.	**	***	
Detrimental effects of perceived job insecurity (injury, sickness, absence, poor sleep, psychological distress), threat of downsizing is associated with stress, sickness, absence and injury.	**	***	
Personal wellbeing directly and indirectly impacts upon injury.		***	***

Table adapted from Carrington and McIntosh (2013, pp.65-66). Based on PricewaterhouseCoopers (2010).

[Carrington and McIntosh \(2013\)](#) argued that these three sets of influences increase the risks of workplace injury and impose psychosocial pressures that can lead to increased mental strain. Yet there has been little investigation into the antecedent factors, and the need for evidence-based research with accurate information about FIFO health effects has been highlighted by the both the mining sector and different parliamentary reports ([Australian Mines & Metals Association, 2015](#); [WA Education and Health Standing Committee \(final report\), 2015](#)), as well as previous research studies ([Bowers et al., 2018](#); [Henry et al., 2013](#); [Miller, 2014](#)).

2.7 FIFO: A Public Policy Issue

Despite the economic benefits and high financial remuneration of the FIFO workforce, indications are that all is not well in the Australian mining industry. Allegations of the mining “curse” negatively impacting families and concerns about employee mental health fuelled debate and eventually led to Australian parliamentary inquiries into FIFO. These included federal or national ([House of Representatives, 2013](#)) and state investigations in Western Australia ([WA](#)

[Education and Health Standing Committee \(final report\), 2015](#)) and Queensland ([Australian Mines & Metals Association, 2015](#)).

Cancer of the Bush or Salvation for our Cities? 2013 Federal Inquiry

The national House of Representatives Committee examined FIFO and DIDO workforce practices in regional Australia and released a report titled “Cancer of the bush or salvation for our cities?” The title neatly captured the stark debate about FIFO/DIDO work practices eroding the way of life (especially in the regions) whilst generating wealth in large urban areas, far removed from places of resource extraction ([House of Representatives, 2013, p. vii](#)). The inquiry reported negative health impacts of FIFO work, largely attributed to social isolation. Negative health impacts included substance abuse, mental health issues, fatigue-related injuries and increased injuries related to high-risk behaviour. The committee found a culture of binge drinking and substance abuse common among the FIFO workforce and described this in a number of formal submissions (e.g., Western Australian Network of Alcohol and other Drug Agencies). Yet it was also acknowledged that, despite anecdotal claims of high substance abuse, little empirical research about the actual prevalence of alcohol and substance intake was available. Subsequent research by [Harvey \(2013\)](#) found levels of binge-drinking and risk of harm more prevalent among the FIFO workforce than the general Australian population. The report stated that depression and anxiety, in particular, were consistently serious concerns.

Beyondblue (an independent non-profit organisation in Australia that assists the public with free access to mental health services) claimed that males generally experienced several barriers to seeking and accessing help for depression and anxiety, including high levels of stigma, a perceived lack of mental health skills and support, a need for control, and a preference for action over introspection. The submission reported that these barriers to accessing mental health services could be exacerbated among FIFO/DIDO workers ([Beyondblue, 2013](#); [House of Representatives, 2013](#)).

A submission from Rio Tinto, a global mining employer, asserted that Employee Assistance Programs (EAP) were provided to FIFO workers to assist them with mental health issues ([House of Representatives, 2013](#); [Rio Tinto, 2013](#)). The committee found no evidence to “support a claim that mental health issues were any higher in the FIFO worker population than in the wider workforce”, and concluded that both the age and risk profile of the majority of FIFO workers (young males) made them susceptible to such negative health impacts ([House of Representatives, 2013, pp. 99-100](#)). These two key issues – mental health equivalency with the

general population and the demographic risk profile – were foreshadowed in an ensuing WA parliamentary inquiry. The result of a national inquiry on mental health was a recommendation for the Australian Commonwealth Government to commission new research into the health effects of FIFO/DIDO work and lifestyle factors, as well as developing a comprehensively linked health policy to address the needs of this workforce. In 2019, the Department of Infrastructure and Regional Development website reported that research was “being undertaken on this issue”, including a policy review by the Primary Health Care Research and Information Service based at Flinders University into FIFO/DIDO practices and health services delivery.

The Impact of FIFO Work Practices on Mental Health: 2014-15 WA State Inquiry

The WA inquiry commenced after media reports in mid-2014 suggested that nine FIFO workers had died as a result of self-inflicted injury (or suicide) during the preceding 12-month period. A motion was moved by the Hon. Mark McGowan MLA (leader of the state opposition at the time), and the “impact of FIFO work arrangements on individuals’ mental health” was debated in the Legislative Assembly. The debate concluded in August 2014 with the Legislative Assembly requiring that the Education and Health Standing Committee conducts an inquiry to explore the mental health effects arising from FIFO work arrangements ([WA Education and Health Standing Committee \(final report\), 2015, p. 1](#)). The terms of reference for the inquiry included factors contributing to mental illness and suicide among FIFO workers. The 133 written submissions incorporated anecdotal reports from FIFO employees and their families, non-government organisations, government departments, unions, community groups and mining companies, and comprised a greater number of community and union submissions than mining companies’ submissions that offered relatively little empirical evidence. The committee estimated around 10 per cent of the West Australian population was closely related to a FIFO employee and therefore indirectly affected by FIFO working arrangements ([WA Education and Health Standing Committee \(final report\), 2015, p. 5](#)). This figure does not account for friends, extended family, such as aunts or cousins, businesses and sporting teams, all of which are conceivably impacted by the frequent absences of FIFO mining employees.

The committee made a total of 30 recommendations focused on onshore FIFO arrangements and encompassing the need for legislative change and a Code of Practice ([WA Education and Health Standing Committee \(final report\), 2015, pp. iii-v](#)). The final report highlighted the lack of evidence-based research into FIFO employee mental health. One recommendation was for the WA Minister for Mental Health to fund independent research by the

Mental Health Commission into the impacts of FIFO work arrangements on the mental health of workers and their families. The importance of including a range of different sites and systems (i.e., underground, open cut etc.), construction and production workers, occupational roles, workers on a range of roster compressions and different companies (including contractors) was emphasised in this recommendation.

Inquiry into FIFO Work Practices in Regional Queensland: 2015 Qld State Inquiry

In its report, the Queensland inquiry into FIFO work practices similarly discussed the mental health impacts of FIFO work arrangements. This was the third government-initiated inquiry in Australia to conclude that there was insufficient research on the mental health impacts of FIFO. Different submissions to the Queensland inquiry argued that specific FIFO related factors impacted an employees' mental health and help-seeking. For example, the limited organisational and industry factors that promote formal or informal help-seeking, coupled with poor communication of service availability within companies along with limited formal services available affect employees' help-seeking. These were reflected in the final report as depicted in Table 2.3 below.

2.8 Contested Positions and Different Agendas

A range of contested views emerged between different stakeholder groups in the FIFO federal and state inquiries. Submissions were predominantly from not-for-profit organisations, union groups and individual workers, with a relatively low number from mining companies. Trade union submissions were generally at odds with those of mining companies, industry peak bodies (e.g., the Chamber of Minerals and Energy or CME) and government departments (e.g., the Department of Mines and Petroleum). The various groups had contrasting views on the nature of “the problem” and possible solutions, for instance, how to best regulate mental health. By way of illustration, the CME stated that “CME does not consider occupational safety and health legislation is the appropriate mechanism for addressing this issue and recommends the Committee recognise mental health as a public health issue” (CME submission, p. 23).

Table 2.3 *Identified Factors Affecting Mental Health and Help-seeking*

Factors affecting mental health	Factors affecting help-seeking
<ul style="list-style-type: none"> • Separation from family and friends and disruptions to family life. • Strain of maintaining communication and relationships with family and friends. • Challenges maintaining connection to the broader community (such as sporting or social groups). • Fatigue and stress associated with long working hours and long work swings. • Missing out on key life events. • The tendency not to seek help due to workplace culture or stigma regarding mental health difficulties. • The mental health and wellbeing of off-duty workers “can be significantly impacted by the environment in which they are living while on roster”. • Often no family support network for FIFO workers who leave hospital after being treated for a mental health issue. • Little control over work and life while they are at camp. 	<ul style="list-style-type: none"> • Stigma attached to mental health issues. • Generally negative attitudes of males towards asking for help. • Difficulty identifying symptoms and credible coping strategies. • Concerns about negative impacts on future employment opportunities. • Concerns regarding confidentiality partly explained an underreporting of mental health issues among FIFO workers. • Difficulties accessing both formal services and informal support from family and friends. • Job insecurity compounded by workers’ reluctance to seek help. • Limited organisational and/or industry factors that promote formal or informal help-seeking. • Poor communication of service availability within companies to encouraged stressed and depressed workers to seek help. • Limited formal services available, beyond EAPs.

Table adapted from the key findings in the report from the [Infrastructure Planning and Natural Resources Committee \(2015, pp. 60-61\)](#)

In WA, the Department of Mines and Petroleum has authority for monitoring and regulating occupational health and safety issues. Responsibility for regulating psychosocial risks and hazards by the state government or an industry representative body has important cost implications, as it determines who pays for mental health impacts (e.g., the hospital health care system or the mining industry and their representative bodies).

FIFO job rosters was a central issue in all three Australian government inquiries that found a wide variety of arrangements were being used in the industry; their lengths frequently linked to the distances that workers needed to commute ([House of Representatives, 2013](#)). Rosters consisted of a prearranged number of days at work, often referred to as “on site”, and a prearranged number of days off site. Individual occupations were also aligned with roster lengths; those in professional roles (e.g., engineers) typically worked shorter rosters than those in traditional labouring or transport occupations ([WA Education and Health Standing Committee \(final report\), 2015](#)). Shift patterns, referred to as cycles or shifts, ranged from short cycles, such as eight days at work and six days off work, to extended cycles, such as twenty-eight days at work and seven days off work ([Henry et al., 2013](#); [Storey, 2008](#)).

Overall, the three FIFO government inquiries revealed the polarised and partisan views of mining companies and industry bodies, and that emphasised workers’ free choice to work on a FIFO basis. Proponents of this perspective claimed that workers preferred longer shifts since they were better paid than shorter shifts. In contrast, community groups and trade unions promoted shorter or “even-time” rosters for the wellbeing of workers and their families. From an industry perspective, factors that determine rosters have considerable financial consequences, including providing work/life balance for employees; fatigue management; safety; availability of flights and accommodation; supply of experienced, quality crews; industry standards for rosters; and attraction and retention issues ([Australian Mines & Metals Association Submission number 223, 2015](#); [Infrastructure Planning and Natural Resources Committee, 2015](#)). There were also some significant differences between mining companies, depending on their individual strategic priorities. Nonetheless, the reports signalled wide-ranging discontent with typical rosters and ongoing calls for trade union action to regulate roster lengths in the industry ([Australian Minerals and Mines Association, 2013](#); [House of Representatives, 2013](#)).

In summary, the three parliamentary inquiries attracted substantial public policy interest. Many submissions and all government inquiries concluded there was a need for further evidence-based research into the mental health of the FIFO workforce.

2.9 Demographics of the Workforce

The demographic profile of the mining workforce is an important indicator of whether FIFO employment conditions trigger or precipitate mental health problems and suicide risk, and whether employees are likely to develop issues if they weren't working on a FIFO basis. In a paper discussing the demographics of the FIFO workforce, [Vojnovic \(2016\)](#) suggested FIFO employees worked in high-risk roles for suicide, based on census data and research that assessed coronial reports on work-related suicide. The majority of the FIFO workforce is employed in physically demanding roles and predominantly work full-time or longer hours ([Australian Bureau of Statistics, 2013](#); [Bahn, 2014](#)), commonly as drillers, metal fitters, truck drivers, electricians, geologists and welders ([Australian Bureau of Statistics, 2017](#)). Suicide rates vary across occupations, with labourers, farmers, service workers, skilled trades (e.g., builders and electricians), cleaners, machine operators ([Germain, 2013](#); [Milner et al., 2013](#)) and managers at highest risk, followed by professionals, including engineers ([Routley & Ozanne-Smith, 2012](#)).

A significant predictor of work-related suicide is occupational stress ([World Health Organisation, 2012](#)). Working in intensive and stressful environments can contribute to mental health problems ([Reichenberg & MacCabe, 2007](#)), which in turn, pose a risk for suicide ([World Health Organisation, 2012](#)). Working on a FIFO basis may therefore expose the workforce to heightened risk factors (e.g., reduced social support, occupational stress and challenges to mental health) ([Henry et al., 2013](#); [Velander et al., 2010](#)) and increase the vulnerability of workers predisposed to mental health problems and suicide. An analysis of Australian census data revealed the broad characteristics of the FIFO workforce as predominantly young (25-44 years of age) and 88 per cent male ([Australian Bureau of Statistics, 2013](#)). FIFO employees comprise both mining and construction industry personnel, who are more likely to hold a trade qualification than the general population. The educational profiles of mining and construction industry employees are shown below in Figures 2.5 and 2.6, respectively.

The majority of FIFO employees appear to fit the profile for pre-existing risk factors (gender, age and occupation) and may give the impression that they are at higher risk of mental health issues, including work-related suicide ([Vojnovic, 2016](#)). These issues were all raised in the federal and state parliamentary inquiries and underscored the potential vulnerability of the Australian FIFO mining workforce to a range of mental health problems.

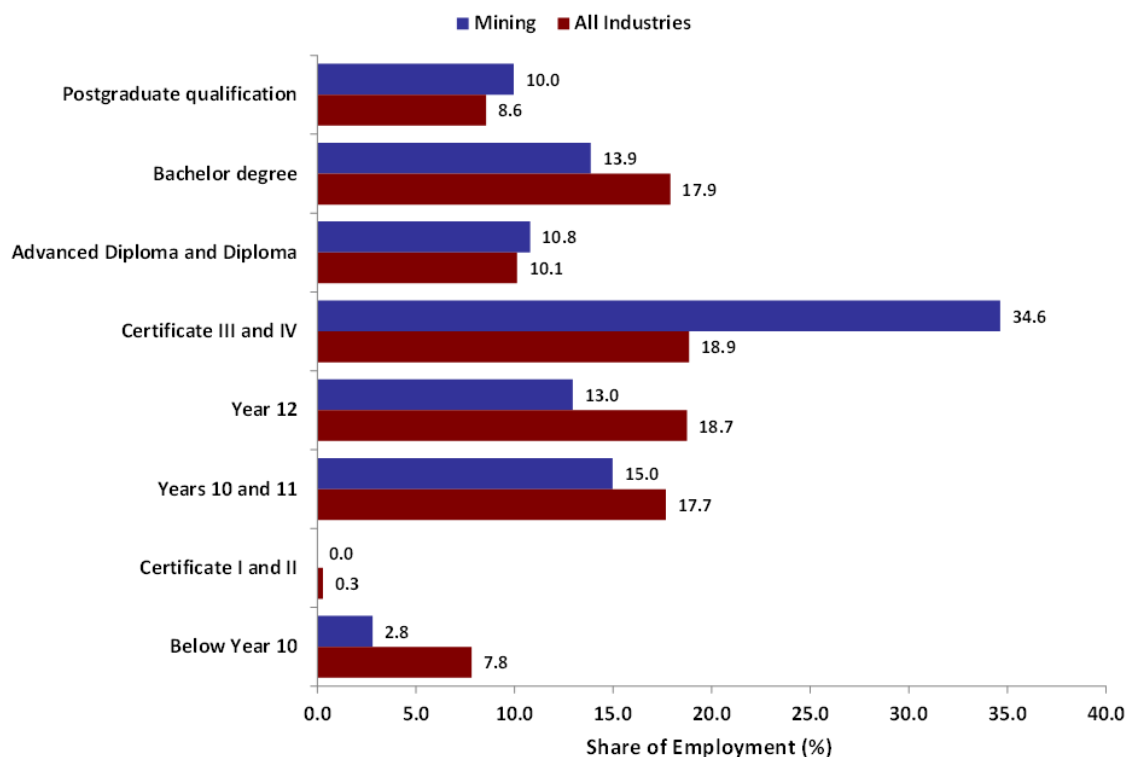


Figure 2.5 *Educational Profile of the Mining Industry.* ([Department of Employment, 2018a](#))

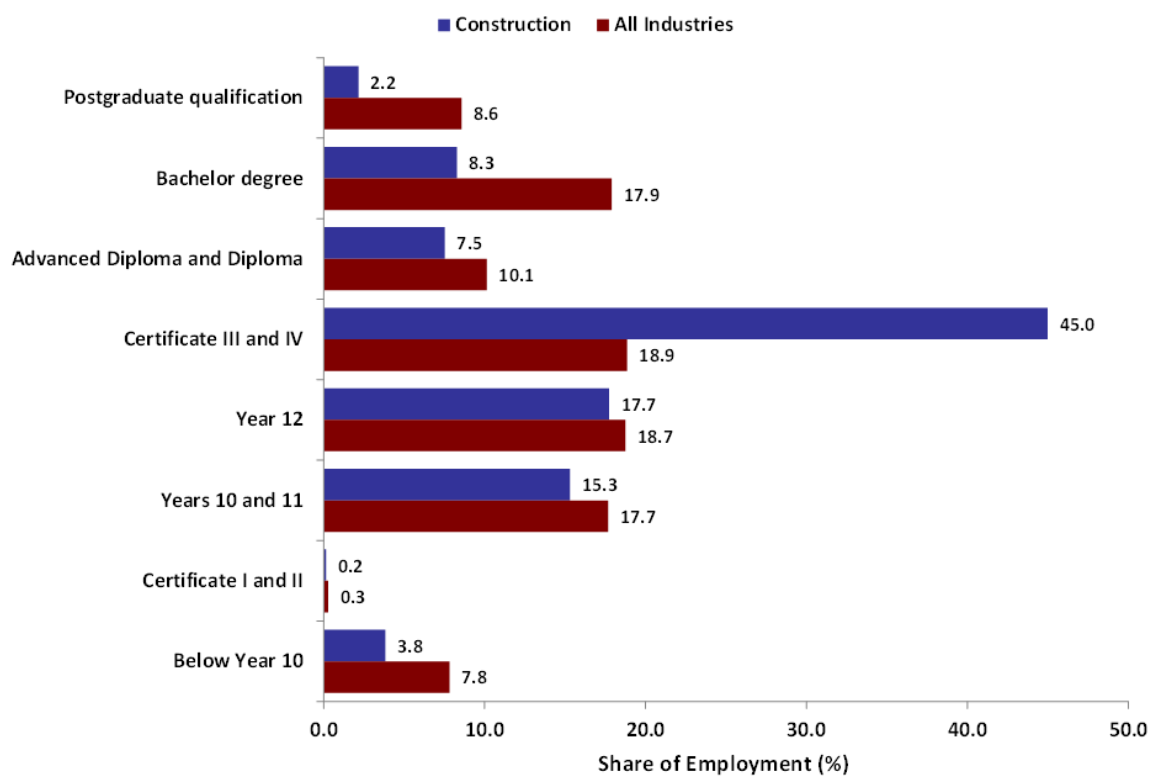


Figure 2.6 *Educational Profile of the Construction Industry* ([Department of Employment, 2018a](#))

2.10 Conclusion

Mining is an important industry in Australia, not only for its ability to generate substantial federal and state revenues, but also as a source of jobs and employment. Whether mining activity is a “cure or a curse” still engenders heated debate. Economic and labour benefits have been extolled as a cure, while on the other hand, the negative social impacts have been criticised as a curse, reflective of the polarised and contrasting perspectives of the mining sector. Research has identified the substantial costs associated with high employee turnover in the FIFO workforce and indicates that organisational culture, support from managers and supervisors, and rosters are important factors for employee retention. The shift away from the company town model towards the widespread use of FIFO working arrangements has also had a range of effects on host communities.

Prior research has identified that workplace factors and the “lifestyle” of FIFO working arrangements exacerbate the risk of mental ill-health and psychosocial strain. While little is known about how employees are actually affected by FIFO working arrangements, the three recent parliamentary inquiries in Australia (federal and state) indicated, at the very least, an increased prevalence of certain mental health issues. The government inquiries recommended further research into the mental health of FIFO workers, but to date, there is little available evidence. Instead, the topic remains shrouded in rhetoric, and the dearth of empirical investigation into the effects of FIFO employment on workers’ mental health now warrants urgent attention.

The following chapter will review the extant literature and relevant theories exploring the influence of psychological health and employment conditions on the psychological wellbeing and help-seeking of FIFO employees in the Australian mining industry.

Chapter 3 - FIFO Employment: Evidence from the Literature

3.1 Introduction

The previous chapter described the emergence and impact of the FIFO employment model in the Australian mining industry and then documented the context of FIFO workers' experiences. This chapter will further demonstrate how and why FIFO working conditions affects employee psychological wellbeing and subsequent help-seeking behaviour. Building on existing knowledge to evaluate the extent to which employees in the FIFO mining industry experience mental health problems, Chapter 3 first reviews the key findings and themes from prior research. These include FIFO working conditions, isolation and loneliness, psychological distress, bullying, hopelessness, stigma and help-seeking. Next, a review of the literature on mental health in the workplace places a spotlight on the various costs and benefits. This is followed by an overview of the barriers to accessing support and an outline of the field of Occupational Health Psychology (OHP), given that the study is situated in this field.

3.2 Prior FIFO Research

Research examining the experiences of Australian FIFO resource industry employees has begun to grow in recent years. Up until the mid-2000s there was little published information about the FIFO workforce, largely because they represented a relatively new population of interest for researchers. The number of studies examining the impact of FIFO employment on employees' mental health subsequently increased, largely in the form of unpublished Honours, Masters, and Doctoral projects. Most of these originated in Western Australia and Queensland, where most of the mining activity was taking place, yet despite the growing focus on the psychosocial effects of FIFO employment, there is still limited empirical information on how employees are affected by various work stressors in supporting their requirements.

Psychosocial (including mental health) studies in Australia have generally consisted of small-sized convenience samples using cross-sectional methods, with participants drawn from a range of locations, rosters and occupations. The research has also largely focused on land-based mining rather than oil and gas ([Sibbel, 2010](#)), and as a result, little is known about the similarities

or differences across different mining subsectors. Mining companies and governments, sometimes in partnership with non-profit organisations, have funded a small number of studies ([for example, Henry et al. \(2013\)](#)), while others were conducted in-house by resource companies and predictably, focused on their own particular requirements ([Pini & Mayes, 2012](#)). As such, they are not all available for public access ([WA Education and Health Standing Committee \(final report\), 2015](#)).

Also noteworthy is that previous FIFO research was undertaken through the lens of different disciplines. The benefit of this multi-discipline approach is increased knowledge about a range of diverse social and health issues affecting the FIFO workforce, ranging from matters of family functionality ([e.g., Meredith et al., 2014](#)), smoking, alcohol consumption, and diabetes ([e.g., Velandar et al., 2010](#)) to the effects of environmental warming and heat stress ([e.g., Maté & Oosthuizen, 2012](#)). The literature on the FIFO workforce also varies in theoretical grounding and analytical frameworks. For example, [Albrecht and Anglim \(2018\)](#) examined employee engagement and emotional exhaustion, using an online diary survey to collect data that were examined through hierarchical modelling. Despite investigating similar concepts, this is a substantially different approach when compared, for example, to [Sibbel \(2010\)](#). Moreover, different research methods have been employed, extending from phenomenological interviews ([employed in Pirotta, 2009](#)) to psychometric testing ([employed in Henry et al., 2013](#)). Studies that used previously validated instruments to assess mental health were found to examine broad mental states (e.g., K-10, General Health Questionnaire) that correlate but do not directly compare with instruments that measure symptoms of specific disorders (e.g., DASS-21, Becks Depression Inventory). The resultant inability to compare results means that the generalisability of the findings is difficult to establish between samples and for the general population (Please see Appendix 1 for further details).

A summary of research that investigates the mental health of the FIFO workforce is presented in Table 3.1 below, followed by a critical review of the key themes identified.

3.3 Key Theme 1: Working Conditions

Over the past decade, substantial links have emerged between theory and evidence of workplace psychosocial risk factors and work-related mental health problems ([Bailey, Dollard, McLinton, et al., 2015](#); [McTernan et al., 2013](#)). The extant FIFO literature identifies a correlation between a number of specific working conditions and mental health. One such study was conducted by [Keown \(2005\)](#), who found the conditions of employment, including accommodation

facilities, terms of employment, shift and roster arrangements, as well as the availability of psychosocial support impacted on employees' mental health. The study used an all-male sample, and as such the results may be limited; however, the information gained contributes significant understanding about the working conditions in the mining industry and was the first to identify roster arrangements as a factor in FIFO employees' mental health.

The effects of roster compression were further clarified by Henry et al., (2013), who undertook a more detailed assessment of its relationship to mental health. Their findings showed FIFO employees on high-compression rosters experienced higher levels of psychological distress compared to those on low-compression rosters. In fact, the scores of FIFO employees on low-compression rosters were more often in the "likely to have a severe disorder" range. In terms of managing the strains associated with FIFO working arrangements, those on high-compression rosters and with partners reported the most ineffective coping strategies. Surprisingly, employees on low-compression rotations were least likely to use any mental health information and services, while those on high- compression rosters were more likely to access telephone crisis lines.

A Queensland study conducted by Barclay and colleagues (2013) found different and conflicting results to those of Henry et al., however, Barclay et al.'s (2013) study is different from other FIFO mental health research for two reasons. First, the gender distribution was 58 per cent male and 42 per cent female, whereas in most previous studies, male participants made up between 81 and 86 per cent of the total sample (Henry et al., 2013; Velandar et al., 2010). Second, the sample largely comprised managers and professionals, of whom almost 70 per cent held a university degree compared with approximately 24 per cent in other research (Henry et al., 2013). Neither the occupations nor the gender distribution of participants were representative of the industry; the research focusing instead on niche segments of the FIFO workforce. The key finding indicated less psychological strain among managers and professionals in the resources industry; allowing for a more nuanced understanding of individual and occupational differences in the FIFO workforce.

Table 3.1 Summary of Australian Resource Industry Research: FIFO Employees' Psychological Health

Author and Year	Title	Nature of Study	Participants	Method	Measures	Key Findings
Gent (2004)	The Impact of Fly-in/Fly-out Work on Wellbeing and Work- Life Satisfaction.	Unpublished Honours thesis	132 FIFO employees	Quantitative	DAS	Poor job relationship and life satisfaction related to roster compression.
Keown (2005)	Digging Deep for Better Health: A study of the Health Status of Men in the Goldfields Mining Industry of Western Australia.	Department of Health publication	148 FIFO & 362 residential male employees	Mixed method survey and interviews	GHQ-12	High levels of depression or anxiety characteristically above clinical cut-off scores.
Clifford (2010)	The Effects of Fly-in/Fly-out Commute Arrangements and Extended Working Hours on the Stress, Lifestyle, Relationship and Health Characteristics of Western Australian Mining Employees and their Partners.	Unpublished PhD thesis	222 FIFO and daily commute employees and their partners, 137 were FIFO employees	Mixed method survey, interviews and physical testing of cortisol levels	DASS-21, PSS and PSSS	Elevated stress in the work-to-home transition period. No significant differences in the depression, anxiety or stress levels reported by FIFO and daily commute employees.
Sibbel (2010)	Living FIFO: The Experiences and Psychosocial Wellbeing of Western Australian Fly-in/fly-out Employees and Partners.	Unpublished PhD thesis	90 FIFO mining employees and 32 partners	Mixed method survey and interviews	GHQ-12, Brief COPE scale	FIFO employees were within the norms for healthy functioning.
Velander et al. (2010)	Digging for Gold and Coming up Blue: A Health Survey in the Mining Industry.	Published in the <i>Journal of Health, Safety and Environment</i>	591 FIFO and residential employees (32.5% were FIFO)	Quantitative survey	DASS-42 and AUDIT	High levels of depression, anxiety and/or stress compared to the general population.

Author and Year	Title	Nature of Study	Participants	Method	Measures	Key Findings
Torkington, Larkins, and Gupta (2011)	The Psychosocial Impacts of Fly-in Fly-out and Drive-in Drive-out Mining on Mining Employees: A Qualitative Study.	Published in the <i>Australian Journal of Rural Health</i>	11 FIFO employees	Descriptive qualitative study	Semi structured interviews	Positive and negative psychosocial impacts of FIFO were identified along with a reluctance to seek support.
Peetz et al. (2012)	The impact of working arrangements on the physical and psychological health of workers and their partners	Report by Centre for Work, Organisation and Wellbeing, Griffith University	2,540 FIFO and residential and 1,902 partners	Quantitative survey	GHQ-12	High levels of psychological distress, particularly related to the number of hours worked a day and perceived work control.
Voysey (2012)	Satisfaction with a fly-in/fly-out (FIFO) lifestyle: Is it related to rosters, children and support resources utilised by Australian employees and partners and does it impact on relationship quality and stress?	Unpublished PhD thesis	245 FIFO employees and 314 partners	Quantitative survey	PSS, PSSS and RSS	A negative and weak relationship was identified between perceived stress and support.
Henry et al. (2013)	FIFO/DIDO mental health research report 2013	Report by the Sellenger Centre, Edith Cowan University, Perth	924 FIFO and residential employees	Mixed method survey and interviews	K-10, TCSI, JSS and GSES	Higher levels of psychological distress than the general Australian population.
Barclay et al. (2013)	Factors linked to the wellbeing of Fly-In-Fly-Out (FIFO) workers	Research Report, CSRM and MISHC, Sustainable Minerals Institute, University of Queensland	286 FIFO employees	Quantitative survey	DASS-21	Equivalent levels of psychological distress to the general population Australian population.

Author and Year	Title	Nature of Study	Participants	Method	Measures	Key Findings
Miller (2014)	Depression, suicide risk and workplace bullying: A comparative study of Fly-in Fly-out (FIFO) and residential workers in Australia	Unpublished Honours thesis	555 FIFO and 129 residential employees	Quantitative survey	BDI-II, BHS and NAQ-R	High levels of psychological distress and risk of suicide.
Bowers et al. (2018)	Psychological distress in remote mining and construction workers in Australia	Australasian Centre for Rural & Remote Mental Health	1,124	Quantitative survey	K-10	Higher levels of psychological distress than the general population Australian National Health Survey 2007-08.
Albrecht and Anglim (2018)	Employee engagement and Emotional Exhaustion of Fly-In-Fly-Out Workers: A Diary Study	Published in the <i>Australian Journal of Psychology</i>	52 FIFO employees	Quantitative survey	A reduced number of items derived from validated scales	A decline in engagement and supervisor support and an increase in emotional demand over the course of the work cycle.

FIFO = fly-in fly-out; Beck Depression Inventory-II (BDI-II); Beck Hopelessness Scale (BHS); Kessler Psychological Distress Scale (K-10); Alcohol Use Disorders Identification Test (AUDIT); Perceived Stress Scale (PSS), Perceived Social Support Scale (PSSS); Roster Satisfaction Scale (RSS); Tactics for Coping with Stress Inventory (TCSI); Job Satisfaction Scale (JSS); General Self-Efficacy Scale (GSES); Depression Anxiety Stress Scale (DASS-21 or DASS-42); Negative Acts Questionnaire-Revised (NAQ-R).

Differences in stress levels during FIFO workers' roster rotations were discovered by Clifford (2010), who surveyed 137 FIFO and 85 residential employees and partners. The results identified no significant differences in depression, anxiety or stress levels reported by the two groups and all employees' scores were within normal range. The most significant finding highlighted differences in employees' stress subscale scores depending on their roster phase, with the work-to-leave transition period correlating with higher stress symptoms. Participants' levels of coping were also reduced during the leave-to-work transition period. Further information on the impact of working conditions emerged from [Peetz et al.'s \(2012\)](#) study of wellbeing and working arrangements among mining workers. Data were collected from 2,540 FIFO and residential employees and 1,902 partners. The results indicated poorer mental health correlated with a higher number of hours worked a day and employees' perceptions of work control. The strength of that research was its large sample size and increased confidence in the reported mental health prevalence rates, although the study did not report the proportion of participants who worked on a FIFO basis. The authors linked the total number of hours worked a day to mental health, a useful finding because it identified a particular stressor in the Australian mining industry and its influence as an antecedent factor on psychological distress.

3.4 Key Theme 2: Isolation and Loneliness

Supportive social interactions have been shown to safeguard against poor mental health, while conversely, mental health problems are exacerbated by poor social interactions ([Takeuchi, 2010](#)). Feelings of isolation are associated with increased withdrawal from and disinterest in work and co-workers ([World Health Organisation, 2001](#)). In the context of FIFO employment, isolation is caused by workers' absence from key family events and friends, engagement in a regimented routine at camp accommodation, and often remote geographical locations of camp sites ([Bowers et al., 2018](#); [Henry et al., 2013](#)). Iverson and Maguire identified isolation as a key variable affecting life satisfaction for mining employees ([Iverson & Maguire, 2000](#)). In fact, the concept of isolation among the FIFO workforce appears to be a common theme in many studies and submissions to the Australian parliamentary inquiries reviewed in Chapter 2. For example, the WA parliamentary report advised: "FIFO takes ... an individual regularly away from home, puts him in isolation from his family and other social supports" ([WA Education and Health Standing Committee \(final report\), 2015, chairman's foreword](#)).

A review of prior research and submissions revealed a predominant view of isolation as an integral aspect of FIFO work. [Pirotta \(2009\)](#) distinguished between different types of isolation and claimed that professional and social isolation, as well as loneliness, were experienced as a psychological cost for many women working on a FIFO basis. She noted possible differences between the effects of isolation on men and women. Difficulties accessing effective communication have also been linked to an increased sense of social isolation among the FIFO workforce. While FIFO mining workers have testified to the negative impacts and increased sense of isolation due to “motelling” (this term describes the allocation of accommodation rooms to an employee for the duration of their cycle but then they are randomly assigned different rooms on subsequent, but regular trips, to their mine site), one mining company claimed:

We think that the sense of community, belonging, fellowship with your workmates is actually enhanced by motelling, because it does not allow people to be left in isolation or left... permanently in one dark corner of a camp; they are able to be moved around to have a more vibrant experience in terms of their life in that facility ([Fortescue Metals Group, March 16, 2015, p. 14](#)) cited in [WA Education and Health Standing Committee \(final report\) \(2015, p. 88\)](#).

Isolation is an important antecedent factor of employee mental health problems and was recognised by [Bowers et al. \(2018\)](#) and [Henry et al. \(2013\)](#), who both reported isolation among FIFO workers increased the likelihood of psychological distress. Regular absences from family, friends and one’s own community and social networks underscore the importance of social supports at work to mitigate the effects of isolation.

3.5 Key Theme 3: Psychological Distress

The prevalence rates of mental health problems varied in the reviewed literature. Studies that found “normal” or “low range” levels of psychological distress were skewed towards smaller sample sizes (i.e., [Keown, 2005](#); [Sibbel, 2010](#)), while those with larger sample sizes appeared to correlate with higher levels of psychological distress than the general population. Commonly reported causes of mental health problems included the pressure of rosters, shift work, missing key family events and financial strain ([Henry et al., 2013](#); [Keown, 2005](#); [Pirotta, 2009](#)), with the

highest stress levels occurring during the leave-to-work transition period or when a FIFO employee departs the family home to travel and commence their next scheduled work roster ([Clifford, 2010](#); [Henry et al., 2013](#)). In relation to the “golden handcuff” debate, employees who earned above \$200,000 reported higher stress levels at work, although the reasons for this weren’t clarified ([Henry et al., 2013](#)). Additional statistically significant risk factors were the length of swings and shifts, pressure from senior management, remote living circumstances and relationship stresses with partners, children and parents ([Bowers et al., 2018](#)).

Many authors (e.g., [Albrecht & Anglim, 2018](#); [Bowers et al., 2018](#); [Henry et al., 2013](#); [Miller, 2014](#); [Pirotta, 2009](#); [Velandar et al., 2010](#)) concluded that the psychosocial working environment in the WA mining industry posed numerous challenges for employees and may be responsible for high rates of mental health issues. This is consistent with a broader analysis of mental health concerns and costs within the mining industry ([McTernan et al., 2013](#)). One limitation of the FIFO employee psychological health research reviewed is that the studies routinely exclude the valuable insights of (former) employees who have left the industry.

3.6 Key Theme 4: Bullying and Hopelessness

Workplace bullying is arguably an ongoing issue for many organisations in Australia and around the world ([Glambek, Skogstad, & Einarsen, 2018](#)). [Einarsen et al. \(2018\)](#) recommended increased organisational strategies to prevent bullying and improve employees’ responses. Recognition of workplace bullying as a risk factor for mental health problems and job loss has escalated in the academic literature ([Glambek et al., 2018](#)), evidenced by increased workers compensation claims for mental strain. In response, legislation and codes of practice have been developed to mitigate against bullying and its impact on workers’ health and wellbeing ([Dollard, Bailey, et al., 2012](#)). Bullying is more likely to occur in organisations with limited policies, practices and procedures and has been unequivocally linked to employee mental health problems ([Law et al., 2011](#)). Australian work health and safety laws recognise the duty of care and responsibility for preventing workplace bullying as the domain of employers ([Dollard, Bailey, et al., 2012](#)), yet there is a lack of information on how working conditions, such as low control and low support, affect bullying and employee mental health ([Bailey, Dollard, & Richards, 2015](#)).

The FIFO mining workplace culture has been described as competitive and commonly characterised by discrimination among workers including, for example, women working underground ([Carter & Kaczmarek, 2009](#)). Widespread bullying was reported on some sites

([Miller, 2014](#)), and in certain cases, FIFO workers were the target of bullying, intimidation and even dismissal because they questioned safety practices ([Henry et al., 2013](#)). [Miller \(2014\)](#) investigated the effects of bullying and the resultant sense of hopelessness (linked to suicidal behaviour) in the FIFO workforce from a survey of 555 FIFO and 129 residential employees in WA. Based on an objective measure, the results showed that 53 per cent of FIFO and 45 per cent of residential workers were bullied, while on a subjective measure, nearly 10 per cent of FIFO and nearly 5 per cent of residential workers labelled themselves as victims of bullying. Most notably, FIFO mining workers reported substantially more bullying than residential mining workers. The study also identified hopelessness among FIFO workers as a strong predictor of suicide ([Leach, Poyser, & Butterworth, 2017](#)). To date, Miller's (2014) research is the only study to assess suicidal ideation amongst FIFO mining employees using a hopelessness measure to explore more nuanced experiences of mental health in this population. It is also one of very few studies to include a negative work demand (bullying) and relate this to depression amongst FIFO employees.

3.7 Key Theme 5: Stigma and Help-Seeking

Individuals who experience mental health problems have a history of being perceived with suspicion, fear and scorn ([Corrigan, 2004](#); [Nash, Silva, & Litz, 2009](#)). The consequences of these stigmatised attitudes and discrimination remain, compounding the negative effects of mental disorders ([Nash et al., 2009](#); [Reavley & Jorm, 2011](#)). Widespread misconceptions about mental health problems in society are often perpetuated by the media ([Betton et al., 2015](#)). Common myths range from mental disorders being caused by weakness, a lack of self-discipline and willpower, and individuals with mental illness are unpredictable and should not be given any responsibility ([Reavley & Jorm, 2011](#)). Such misconceptions perpetuate stigmatised attitudes and result in stereotyping, prejudice and discrimination ([Nash et al., 2009](#); [Thornicroft et al., 2007](#)).

Stigma and help-seeking were highlighted in the literature as important domains in the FIFO mining context ([Bowers et al., 2018](#); [Henry et al., 2013](#); [Torkington, Larkins, & Gupta, 2011](#)). A number of studies showed that FIFO employees generally used ineffective types of coping behaviours, such as using alcohol, rather than effective help-seeking strategies like talking about their experiences. [Keown \(2005\)](#) observed some positive coping strategies among the FIFO workforce, such as planned responses, positive reframing and active coping. Nevertheless, ignoring personal needs and emotional withdrawal were widely reported ([Henry et al., 2013](#)), in addition to limited awareness of the support services available to FIFO mining workers. One in

five employees reported that their industry did not have onsite counselling facilities and one in ten claimed they did not have access to an Employee Assistance Program (EAP). It is unknown whether these services were lacking or whether employees were merely unaware of them. However, the finding strongly suggests that employees require more education about available supports and how to access them ([Bowers et al., 2018](#); [Henry et al., 2013](#); [Torkington et al., 2011](#)). Consistent with studies that indicate females are more likely to access formal and informal supports ([Rickwood & Thomas, 2012](#)), [Henry et al. \(2013\)](#) found female FIFO mining employees more likely than males to access friends and family, supervisors, EAPs, onsite mental health and counselling services, and self-help information. Importantly, a significant number of employees reported they were not likely to access any mode of mental health information and services.

Both structural (e.g., knowledge of support services and time to access them) and attitudinal barriers (e.g., preference for handling their own problems, perceptions of being viewed differently) to care have been identified in the literature ([Bowers et al., 2018](#); [Henry et al., 2013](#); [Torkington et al., 2011](#)). Specifically, stigma and a lack of available services (for example, limited reception on site to facilitate telephone counselling) were identified as key barriers to seeking treatment in a number of studies, and collectively indicate the possible existence of systemic issues in the FIFO employment model that effect help-seeking behaviour. ([Bowers et al., 2018](#); [Henry et al., 2013](#)).

The previous sections have briefly reviewed the key mental health themes and domains associated with FIFO workers and identified five relevant issues to the research questions in this study. The first theme referred to several working conditions inherent in the FIFO mining work model that may exacerbate mental health problems. The second theme encompassed the influence of feelings of isolation, loneliness and limited social networks on workers' dispositions towards depressive symptoms and unhelpful coping strategies. The third theme acknowledged increased psychological distress and worsened stress levels during home-to-work transition periods. Specifically, depression is likely to influence the performance of workers through decreased concentration and increased risk of suicide; while anxiety is likely to heighten physical tension, sleep disturbance and irritability. The fourth theme, bullying and a sense of hopelessness, was linked to increased risk of depression and suicide, as well as impacting on concentration, performance and safety. Bullying was also likely to lead to disengagement at work, increased social isolation and loneliness, reduced motivation and increased symptoms of depression. The fifth theme, stigma associated with mental health problems, is likely to increase workers' negative beliefs about seeking treatment, thereby decreasing help-seeking behaviour, self-esteem and self-efficacy.

3.8 Barriers to Help-Seeking

In order to manage the mental health of FIFO workers, it is necessary to gain a better understanding of the barriers they experience in accessing mental health treatment, also referred to as “barriers to help-seeking” or “barriers to care” ([Britt & Jennings, 2017](#); [Wade et al., 2015](#)). Early treatment, when symptoms first appear, is an effective way of preventing more severe mental health problems in the future ([Britt & McFadden, 2012](#); [Rickwood, Deane, & Wilson, 2007](#)). However, there is substantial evidence to suggest that individuals with psychological health concerns often do not access health services that could assist them. In particular, barriers to engaging with mental health treatments are common for individuals with moderate mental health concerns in the working population. This was explored by [Andrade et al. \(2014\)](#) using data collected by World Health Organisation surveys with a representative sample of 63,678 individuals who were interviewed in person across 24 countries. The barriers to care were analysed at different levels of clinical severity. Individuals with a disorder (for example, depression or anxiety) classified by the DSM-IV during the preceding twelve months, were assessed according to their barriers to receiving treatment. The findings showed that younger adults and females were more likely to recognise their own need for treatment. Low perception of the need for treatment was identified as the most common reason for not initiating treatment and was more common in mild and moderate than severe cases. Individuals with a disorder and perceived need for treatment were inclined to manage the problem on their own, a major barrier to initiating treatment. The study assessed both structural and attitudinal barriers. Structural barriers included:

- Finance (i.e., the cost of treatment);
- Availability of services;
- Transportation to services;
- Inconvenience;
- Not understanding the procedures and options for getting treatment;
- Perceived lack of control over being able to find the time and resources for treatment;
- Not being able to get time off work; and
- Not knowing where to receive treatment for psychological problems.

Armed forces on deployment experience additional structural barriers, including a lack of mental health services in remote locations and a reluctance to attend services that see them

removed them from their organisational unit ([Fertout et al., 2015](#); [Hoge et al., 2004](#)). It is tentatively suggested these may also apply to the FIFO context. Attitudinal barriers included a preference for dealing with one's own problems, perceived ineffectiveness of treatment, a belief that they will recover without treatment, that the problem is not severe, loss of credibility, and the most commonly reported attitudinal barrier, stigma ([Andrade et al., 2014](#); [Britt et al., 2008](#); [Fertout et al., 2015](#)). Both structural and attitudinal barriers to care are well documented among FIFO employees in the Australian mining industry ([Henry et al., 2013](#)).

Differences in barriers to care between different types of mental disorders, for example, substance misuse compared to grief, have also been highlighted in a number of studies, yet [Vogel, Wade, and Hackler \(2007\)](#) highlighted the dearth of research exploring these differences. Organisational and personal factors act as barriers to care in the workplace context, for example, in the case of FIFO employees in the Australian mining industry, structural barriers may present as a lack of services in remote locations (organisational) and a lack of time due to long rosters (personal) ([Henry et al., 2013](#)). Attitudinal barriers may be linked to a predominantly macho workplace culture that emphasises mental toughness (organisational) and a preference for managing one's own problems (personal) ([Bowers et al., 2018](#)). Some research ([for example, Andrade et al., 2014](#)) operationalised stigma as a barrier to care, while [Britt et al. \(2008\)](#) explored stigma and barriers to care as distinct constructs through empirical research. Two studies investigated how individuals who perceived stigma and experienced barriers to care mediated the relationship between stressors and psychological symptoms. The first of these used college students, and the second, military personnel, the latter frequently likened to the FIFO workforce (for example in [Carter & Kaczmarek, 2009](#); [Keown, 2005](#)) to illustrate differences between employment contexts. Factor analysis supported the hypothesis that stigma and barriers to care were separate constructs. Interestingly, stigma perception among the student sample was found to interact with stress to predict depression, with higher stigma strengthening the relationship between stress and depression. However, in the military sample, barriers to care interacted with work overload to predict depression, and the higher the barriers to care, the stronger the relationship between work overload and depression. [Britt et al. \(2008\)](#) recommended assessing both barriers to care and stigma as moderators to the stressor-strain relationship, and emphasised development of interventions to concurrently reduce stigma and remove barriers to care. While acknowledging distinctions between stigma and attitudinal barriers to care, a majority of research studies have framed stigma as a barrier, and so for the sake of consistency stigma has been referred to as such in this research.

As previously indicated, the literature has highlighted similarities between FIFO and military workforce conditions, such as travel away from home, shift work and the male-dominated workplace environment ([Carter & Kaczmarek, 2009](#); [Keown, 2005](#)). Structural and attitudinal barriers to care were further explored in a mixed methods study on a sample of military personnel ([Zinzow et al., 2012](#)). Both barriers to and facilitators of seeking mental health treatment were analysed. The study recognised previously under-investigated key themes, such as participants' concerns about medication, discomfort discussing mental health problems, beliefs promoted by the military workplace culture, positive leadership behaviours and witnessing the efforts of others to seek treatment. Barriers established by previous research included career concerns, stigma, treatment concerns, leadership problems and practical issues. Facilitators for seeking treatment were cited as social support, support of leaders and perceived levels of symptom severity. The authors recommended treatment interventions be aimed at reframing negative perceptions, targeting leadership behaviour as a point of change, and testimonials from others who had overcome barriers and successfully sought and received treatment ([Zinzow et al., 2012](#)). The review of the literature identified attitudinal barriers to care, especially stigma, as major obstacles to accessing support that can assist FIFO employees.

3.9 Occupational Health Psychology

Work, health and safety policies are well established in the mining industry ([Bahn, 2014](#)), but the psychological and social (psychosocial) safety of employees is a far more recent consideration ([Bailey, Dollard, & Richards, 2015](#); [Hall et al., 2013](#)) in public policy and academe ([McTernan et al., 2016b](#)). The unification of work and psychology was initiated by [Raymond, Wood, and Patrick \(1990\)](#), who asserted the field of psychology had an obligation to advance healthy work environments. The authors identified the need for reducing work-related disease and injuries and promoting public health in the workplace, and termed this area Occupational Health Psychology (OHP). [Quick et al. \(1997\)](#) supported the concept and suggested developing a framework to address psychosocial needs in the workplace for the benefit of employees, their family and organisations. Quick and his colleagues identified primary, secondary and tertiary interventions in the work context. Described as a “young discipline that has emerged from the changing aspects of work, the workforce, legislative events and research advances” ([Houdmont & Leka, 2010, p. 27](#)), OHP concepts have garnered considerable interest and support from researchers and practitioners internationally.

A definition of OHP, understood as applied psychology in the context of occupational health issues ([Houdmont & Leka, 2010](#)) has long been debated. OHP is described as an evidence-based applied science oriented towards problem solving and intervention ([Houdmont, Leka, & Cox, 2007](#)). Differences between OHP perspectives in North America and Europe are interesting to note. According to [Cox, Griffiths, and Rial-González \(2000\)](#), European OHP is established from health psychology, work and organisational psychology, and social and environmental psychology. However, [Adkins \(1999\)](#) argued that North American OHP originated from the fields of public health, management, psychology, medicine and occupational health and safety. Despite these differences, [Houdmont and Leka \(2010\)](#) advocated for addressing psychosocial issues at work and recommended following [Quick et al.'s \(1997\)](#) integration of behavioural science, medicine and management. Subsequently, [Houdmont and Leka \(2010, p. 8\)](#) offered a definition of OHP as “the contribution of applied psychology to occupational health”, following the European view of OHP as multidisciplinary. The North American definition appears to be consistent with the European perspective, but includes psychological perspectives alongside the views of other occupational sciences ([Houdmont & Leka, 2010](#)).

The field of OHP was partly developed by a repository of publications associated with work and psychology. Seven categories of interest were identified after a review of dominant themes was published in the *Journal of Occupational Health Psychology*, viz., physical and emotional stress; burnout; the work–family interface; aggression, violence and harassment; safety; employment issues; and health issues among employees ([Macik-Frey, Quick, & Nelson, 2007](#)). Other well-published topics in two major OHP journals, *Journal of Occupational Health Psychology* and *Work & Stress* ([Houdmont & Leka, 2010](#)) included work engagement ([Bakker et al., 2008](#)), meaningful work ([Arnold et al., 2007](#)), job demands and resources ([Bakker et al., 2007](#)), and a psychosocial safety climate as antecedent factors for conducive work environments and psychological health problems ([Dollard & Bakker, 2010](#)). For the Australian FIFO mining workforce, such topics are highly relevant for determining how job demands and work environments are linked to mental health.

In the workplace, psychological and behavioural issues have increasingly been accepted as managerial and organisational responsibilities ([Macik-Frey et al., 2007](#)) with important implications for mining MNEs. The [World Health Organisation \(2014\)](#) recognised the importance of mental health in a work context and recommended workplaces develop mental health policies and programs. A focus on reducing psychosocial hazards, such as long shifts and not being paid on time, for the mutual benefit of employee health, company outcomes and the wider community

have increasingly been included in national agendas, pioneered by Canada and Australia ([Dimoff & Kelloway, 2013](#); [Safe Work Australia, 2012](#)). Furthermore, changes to work content and context (for example, access to work emails after hours and using Smartphones while on recreation leave) signal a higher prevalence of work-related psychosocial risks, and OHP research offers unique insights into reducing such risks for FIFO mining employees. As a relatively new field, OHP has much to offer contemporary workplaces in the interface between work and psychology. How FIFO employees manage the strains of their occupations and mining MNEs manage the dual demands of their workforce's mental health and organisational goals are attracting global attention.

3.10 Conclusion

Despite an increased focus on psychosocial issues among the FIFO mining workforce, there remains a lack of empirical research on their mental health and help-seeking that this thesis attempts to address. The FIFO research literature highlights five key themes related to the research questions: (i) FIFO working conditions may exacerbate mental health problems; (ii) feelings of isolation, loneliness and limited social networks; (iii) increased rates of psychological distress; (iv) bullying and a sense of hopelessness linked to risk of depression and suicide; and (v) stigma associated with mental health problems and reduced help-seeking behaviours.

The literature review not only showed strained mental health among FIFO workers, but also a tendency not to access mental health support, due to systemic characteristics of FIFO mining working arrangements (structural barriers) and stigma (attitudinal barriers). Examples of barriers cited in the literature were availability, transport and convenience of support services, not knowing how and where to access mental health treatment, and not having the time, finances and other resources to do so. These barriers mean that FIFO workers with mental health concerns frequently do not access formal support services that could assist them. The literature also indicated that work, health and safety is firmly embedded within contemporary Australian workplaces, but Occupational Health Psychology (OHP) is only just emerging as an equally crucial consideration. Together, these ideas imply that psychosocial safety climates need further development to assist FIFO mining workers who experience mental health problems or difficulties.

Chapter 4 - Conceptual Framework and Model

4.1 Introduction

The previous chapter discussed the key difficulties experienced by FIFO mining employees and the barriers to their help-seeking behaviours. This chapter will outline the theory and conceptual framework used in the thesis. Five key areas are reviewed with a focus on the Australian FIFO mining industry workforce: (i) psychological wellbeing; (ii) cultural adjustment; (iii) help seeking; (iv) mental health stigma; and (v) FIFO working conditions. Each area is considered in some detail, leading to the development of a series of hypotheses aimed at answering the research questions. A conceptual model is then proposed that encapsulates the aforementioned elements.

4.2 Research Questions

Psychological wellbeing, cultural adjustment, stigma and help-seeking are internal processes that determine the ways in which we experience and interact with the environment. The literature reviewed on these constructs suggests that individuals who are better able to culturally adjust could reasonably be expected to encounter lower symptoms of mental health problems, and therefore perceive less stigma and engage more readily in help-seeking. Similarly, it follows that individuals who experience poor cultural adjustment could be expected to display more symptoms of mental health problems, perceive more stigma and thus engage less readily in help seeking. While this sequence might appear reasonable, it has not been empirically examined.

The broad research objectives of this thesis were outlined in Chapter 1. As a general reminder of what was stated there, the questions that the study seeks to address are:

- To what extent are self-reported symptoms of depression, anxiety and stress experienced by FIFO mining employees and how do these rates vary under different working conditions?
- In what ways are adjustment, psychological wellbeing, stigma and help-seeking among FIFO mining employees related?

- What is the influence of working conditions on the relationships between adjustment, psychological wellbeing, stigma and help-seeking among FIFO mining employees?

4.3 Underpinning Theory

In this thesis, the Theory of Planned Behaviour (TPB) ([Ajzen, 2011](#)) and the Process Theory of Help-Seeking ([Rickwood et al., 2005](#)) were used to explain psychological wellbeing and help-seeking among FIFO workers, with inherent weaknesses in each theory complemented and strengthened by the other. The study drew on both theories to explain the relationships between the variables in order to answer the above research questions, while the Jobs Demands-Resources (JD-R) model included the organisational perspective. Together, TPB and the Process Theory of Help-Seeking helped describe how FIFO mining employees became aware that they were experiencing a mental health problem and the intentions they took to engage with support. JDR clarified how working conditions affected both psychological wellbeing and help-seeking.

4.3.1 Theory of Planned Behaviour

TPB asserts that individuals' attitudes toward behaviour, subjective norms and their perceived behavioural control influence their intentions and subsequent behaviours, as depicted in Figure 4.1 below.

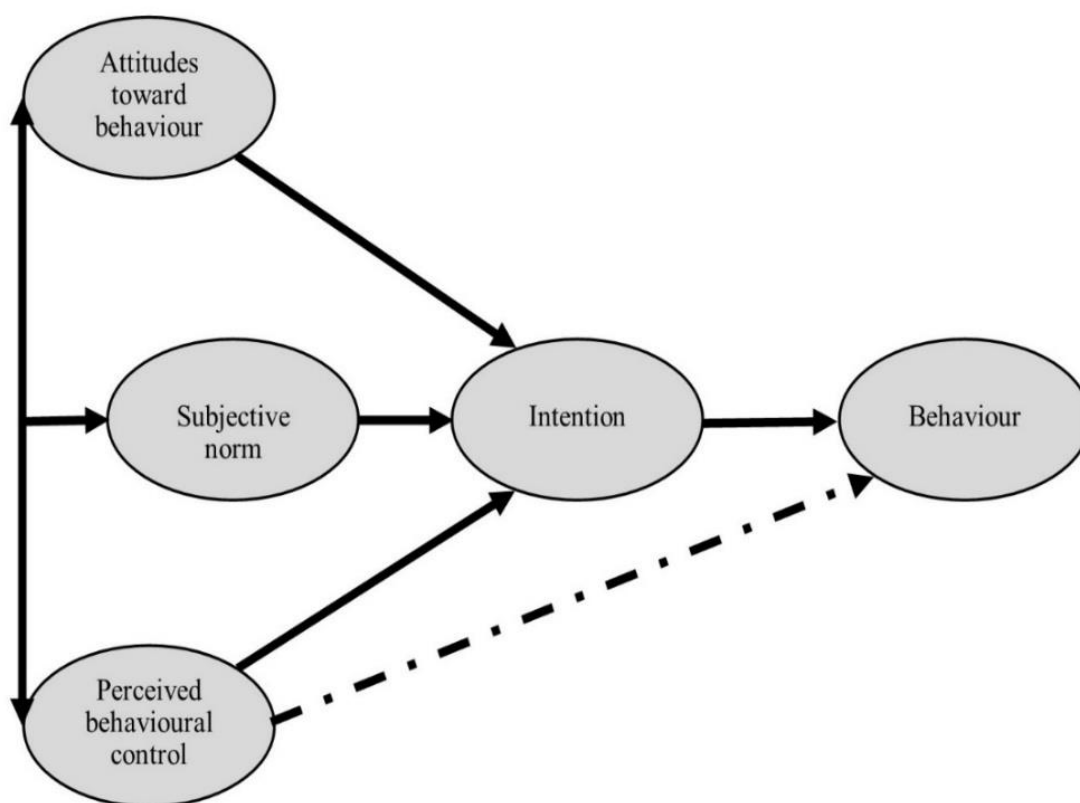


Figure 4.1 Theory of Planned Behaviour ([Adapted from Ajzen, 1991, p. 182](#)).

[Wilson et al. \(2005\)](#) described the relationship between help-seeking intentions and behaviour using TPB. This was further validated by research that identified a higher correlation between intentions and behaviour than between attitudes and behaviour in a mental health treatment setting ([Zemore & Ajzen, 2014](#)). [Ajzen \(1991\)](#) developed TPB as an extension of the earlier Theory of Reasoned Action ([Ajzen & Fishbein, 1980](#)) by including perceived behavioural control. TPB has been widely used to understand how individuals engage in health behaviours and is empirically well supported. It involves intra-personal steps that inform the process of decision-making and subsequent actions.

TPB has been criticised in the literature for not including an emotive component, since this can affect behaviour, irrespective of the attitudes expressed by workers ([Ajzen, 2011](#); [Armitage & Reidy, 2008](#)). For example, a FIFO mining worker might have a very positive attitude towards telephone counselling but not access counselling because he/she is not distressed. Or, a worker might have a very negative attitude towards mental health literacy training and little intention to attend, yet engages in sessions because his or her co-workers do. Ajzen responded to this criticism

by suggesting that emotion is in fact included as an unmeasured component that influences behavioural, normative and/or control beliefs. He also acknowledged the role of emotion as an important determinant of health behaviour.

In addition to the above points, TPB is a prominent framework that is used for predicting and explaining behaviour. The theory is increasingly applied as a framework with which to conduct behaviour change interventions. The implication of this is that using the TPB as a framework in the current research may assist to indicate directions for future help-seeking behaviour change programs within the mining industry. Steinmetz and colleagues (2016) conducted a meta-analysis as 82 papers that reported the results of 123 TPB-based interventions. The results confirmed the effectiveness such interventions. Further, the authors identified moderators of behavioural change interventions' effectiveness, including gender, education and behavioural domains. The research reported effect sizes the ranged from .14 to .68 for fluctuations in behaviour antecedent variables. These included beliefs, subjective norms, perceived behavioural control, attitudes and intentions. Importantly, the effect size for intention was significant at .34. As the current study uses help-seeking intentions as a key variable, TPB was considered particularly useful as a framework for the current study.

4.3.2 Process Theory of Help-Seeking

To further strengthen the theoretical underpinnings of this study [Rickwood et al.'s \(2005\)](#) Process Theory of Help-Seeking was used to complement TPB, involving a four-step process of (i) symptom awareness; (ii) expression of symptoms and a need for support; (iii) consideration of resource availability and a willingness to disclose mental health concerns; and (iv) seeking help. The process is depicted in Figure 4.2.

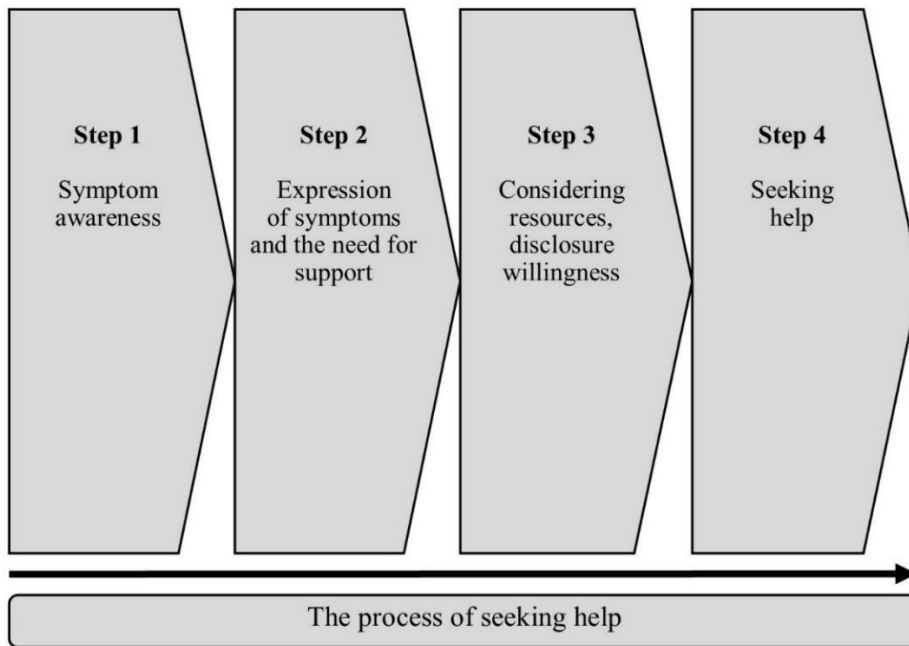


Figure 4.2 Process Theory of Help-Seeking ([Adapted from Rickwood et al., 2005, p. 8](#)).

Employees' intentions to seek help has been shown by research to best explain the relationship between awareness of a problem and help-seeking behaviour, and a better predictor than other constructs, such as willingness and attitude ([Zemore & Ajzen, 2014](#)). Willingness to seek help and the intention to do so are related yet separate: willingness indicates an openness to seeking or receiving help, while intention involves aspects of a plan, decision and motivation ([Wilson et al., 2005](#); [Zemore & Ajzen, 2014](#)). Since empirical evidence demonstrates that intention is one of the best predictors of help-seeking behaviour ([Wilson et al., 2005](#)), it was deemed appropriate to use this construct for assessing the likelihood of FIFO mining employees seeking help.

The limitations of prior help-seeking research include multiple definitions that threaten construct validity, tailored and therefore idiosyncratic items in assessment scales, and a lack of psychometric properties for individual measures of data ([Rickwood & Thomas, 2012](#); [Wilson et al., 2005](#)). There is also little research on employee preferences in terms of help-seeking. Organisations tend to provide assistance programs without undergoing a consultative process with employees ([Reavley et al., 2012](#)), perhaps as a result of the “problems versus company costs” paradigm.

TPB shows that help-seeking intention explains well the relationship between awareness and help-seeking ([Zemore & Ajzen, 2014](#)), while help-seeking intentions depend on preferred

sources (informal versus formal) and availability of support. Help-seeking intentions are also influenced by the nature and severity of the mental health symptoms being experienced ([Wilson, Bushnell, & Caputi, 2011](#)). TPB accounts for individuals' help-seeking behaviours in the context of adjustment by treating "social norms" as an important variable, and the JD-R model assisted in clarifying the effect of FIFO mining working conditions on these intra-personal steps, further described in the follow section.

4.3.3 JD-R Model

The surge of research interest in the interface between OHP, work, and psychology has required development of relevant theories and models for application in contemporary work environments. The JD-R model is situated in the OHP field and focuses on the stressor-stress-strain relationship, with the advantage of being applicable to a range of employment contexts. JD-R is well utilised and appears in the major OHP peer-reviewed journals. JD-R originated from [Demerouti et al. \(2001\)](#), who argued against the prevailing view at the time that employee burnout was limited to the human services field. Demerouti and colleagues drew on theory and research related to the psychosocial aspects of stress in organisational contexts (including [Buunk et al., 1998](#); [Kahn & Byosiene, 1992](#)), and found theoretical support for stressors leading to burnout across work settings. The authors developed and subsequently tested the JD-R empirical model, as did others, and found strong evidence to support their hypotheses (for example, [Hakanen, Perhoniemi, & Toppinen-Tanner, 2008](#); [Mauno, Kinnunen, & Ruokolainen, 2007](#)). JD-R asserts that every job has unique demands and resources. Primarily related to strain and the exhaustion component of burnout, job demands predict negative employee and organisational health outcomes. On the other hand, job resources predict positive outcomes related to employee engagement and motivation. Demerouti et al. associated a lack of resources with employee disengagement. In the context of FIFO employment in the Australian mining industry, examples of job demands are high-compression rosters and long work hours. The JD-R model is depicted in Figure 4.3 below.

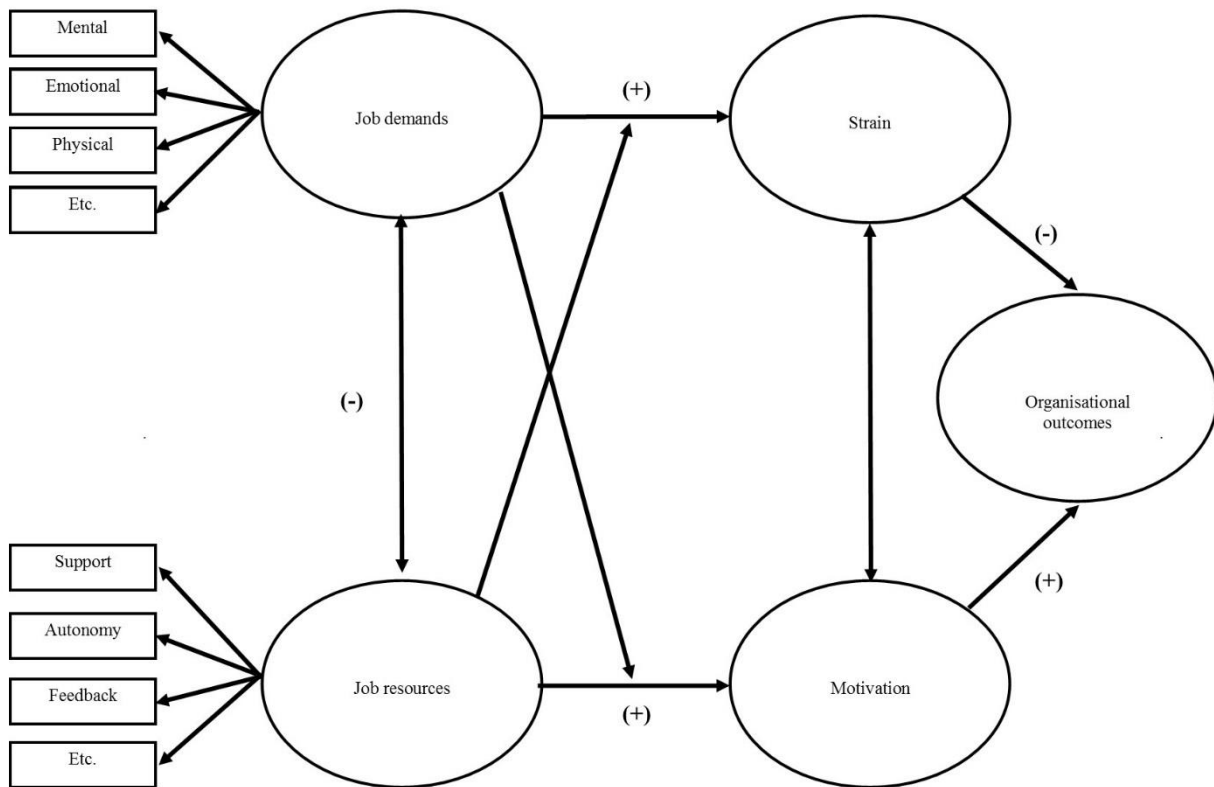


Figure 4.3 Jobs Demands-Resources Model, adapted from [Demerouti et al. \(2001\)](#).

Like most models in the behavioural sciences, JD-R has both advantages and limitations. Longitudinal research ([Hakanen et al., 2008](#)) that examined the work-home interface ([Demerouti, Bakker, & Bulters, 2004](#)) confirmed JD-R as a robust model. Importantly, JD-R can be applied to indicate both positive and negative functions of employee psychological health to cohesively explain how organisational characteristics influence individual responses ([Bakker & Demerouti, 2008](#); [Demerouti et al., 2001](#)). Since job resources can lessen some job-related strain, organisations that provide resources for their employees may be reducing some of the negative impacts of stressful work.

The limitations of JD-R include a lack of standards regarding specific job demands and resources. For example, autonomy may be viewed as a job resource ([Bakker, Demerouti, & Euwema, 2005](#)) in one work context and a job demand in another. Organisational outcomes are classified as either positive or negative; JD-R is unable to provide for the multi-faceted effects of organisations on their employees and vice versa. Another limitation is that causality cannot be assumed for wider implications of workplace health and safety (for example, workplace compensation claims).

4.3.4 Theoretical Integration

In this thesis, the TPB is complemented by the Process Theory of Help-Seeking and further informed by the Jobs Demands-Resources model and this relationship is depicted below in Figure 4.4.

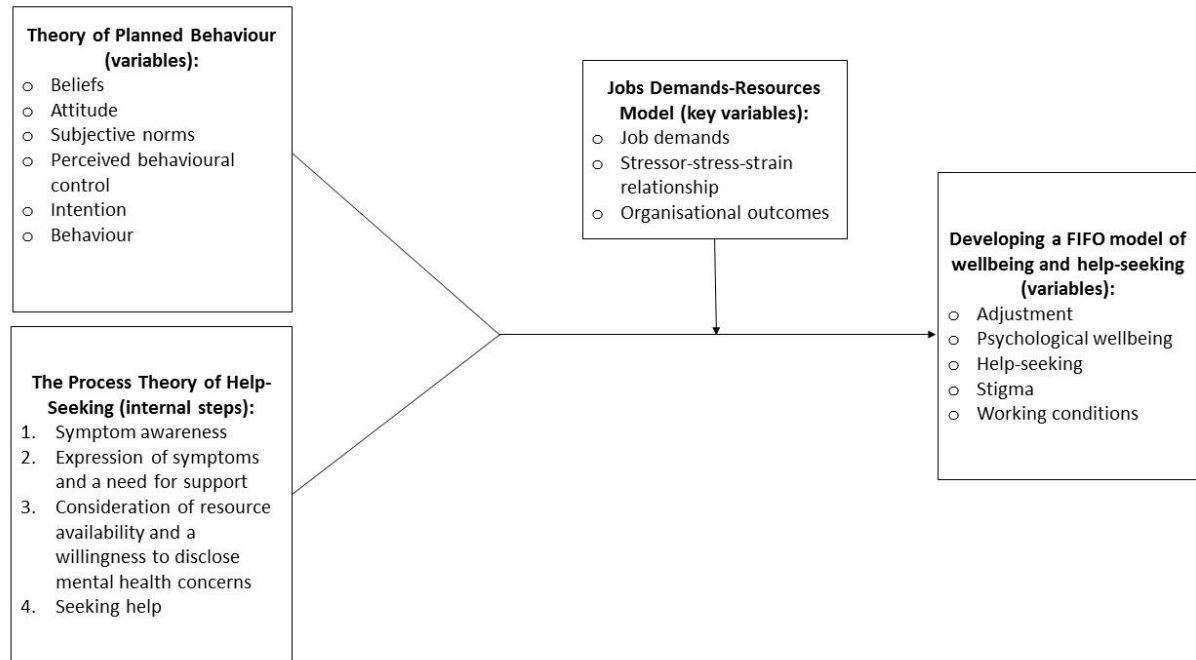


Figure 4.4 Broad Theory Integration.

The Process Theory of Help-Seeking posits that individuals must be aware of their symptoms in order to seek help ([Rickwood & Thomas, 2012](#); [Wilson et al., 2005](#)), which is not necessarily the case in TPB. This is an important strength of TPB, since individuals' psychological state may reduce awareness of their current affective state and impair their cognitive awareness of the need for help ([Saunders & Bowersox, 2007](#); [Wilson & Deane, 2010b](#)).

A major finding in the literature was the large number of studies that identified stigma as a key barrier to help-seeking. The Process Theory of Help-Seeking facilitates a four-step process of conceptualising help-seeking as a negotiation between an individual's intra-personal and interpersonal domains. The concept presumes that through the process of seeking help from others ([Davies, 2015](#)) the intra-personal domain becomes more interpersonal. Deciding to seek help is central to individuals' personal experience of psychological distress and their subsequent actions to gain support ([Wilson & Deane, 2010b](#)). Since the theory includes individuals' knowledge, attitudes and beliefs regarding available help sources, in an employment context, help-seeking is

likely to be influenced by the organisations policies, procedures and practices, available support, such as EAP, and workplace culture.

A significant weakness in the majority of other social-cognitive help-seeking models is the supposition that decision-making to seek help is a rational process that directly determines the behaviour of individuals ([Wills & Gibbons, 2009](#)). This is also a limitation of the Process Theory of Help-Seeking, so TPB was used in the current research to mitigate the effect. While few models acknowledge that individuals' affective state can influence their cognitive responses to the affective state, it has been established that in order to seek help individuals must first identify their symptoms and need for help (i.e., perceived need for support and mental health literacy) ([Rickwood et al., 2005](#); [Rickwood & Thomas, 2012](#)). Used together, it is contended that TPB and the Process Theory of Help-Seeking provides a deeper understanding of the steps involved in FIFO mining employees becoming aware of their mental health problems in order to engage with available supports. FIFO mining employee help-seeking was further clarified through JD-R, indicating how working conditions can potentially impair psychological wellbeing and help-seeking.

4.4 Psychological Wellbeing & Job Demands

The historical view of mental disorders as opposing mental states has been challenged by an emerging consensus that emotional health and mental ill-health are on a continuum ([Davies, 2009](#)). Understanding this contains important research implications ([Clark & Watson, 1991](#); [Watson, Clark, & Harkness, 1994](#)). Theoretically, depression and anxiety are distinct, yet considerable overlap between these conditions has created research difficulties ([Lovibond & Lovibond, 1995](#)). Previous empirical assessments of differences between individuals with these disorders show the clearest differentiation between depression and anxiety is physiological in nature. Specifically, physical symptoms occur with anxiety that are linked to the biological fear response, but do not occur with depression ([Clark & Watson, 1991](#); [Watson, Gamez, & Simms, 2005](#)). Therefore, physical symptoms are useful for differentiating between depressive and anxious symptoms.

Strong and common indicators of broad psychological wellbeing are depression, anxiety and stress symptoms (Henry & Crawford, 2005; Lovibond & Lovibond, 1995). Lovibond and Lovibond (1995) assert that high negative affect relates to both depression and anxiety and that low positive affect relates only to depression and this has received considerable empirical support.

Positive affect is characterised by enthusiasm and energy levels while, low positive affect is comparable to anhedonia (Davies, 2009; Tarlow & Haaga, 1996), one of the key criteria of depression and major depressive disorders (DSM-5 American Psychiatric Association, 2013). The concept of stress further complicates researching negative affective conditions (Lovibond & Lovibond, 1995). This is because stress often precipitates experiences of depression and anxiety, in addition to stressful life events leading to a characteristic stress response of impaired function and chronic arousal (Barlow & Durand, 2011). Stress is considered as an affective or emotional state (DSM-5 American Psychiatric Association, 2013) and while a stress response has some parallels with anxiety, it is a separate construct. It is important to understand incidence of depression, anxiety and stress among FIFO workers so that different antecedent factors of these disorders may be identified. Therefore, it is relevant to understand how different FIFO working conditions effect different indicators of psychological wellbeing.

Further, understanding how workers may be effected by FIFO working conditions depending on the type of problem (e.g. emotional problems or suicidal thoughts) they experience is useful to illustrate the nuances of these relationships. As outlined in Chapter 3 Key Theme 1: Working Conditions, prior research into mental health among the FIFO workforce has revealed some antecedent factors to psychological wellbeing. Empirically supported job demands that effect worker psychological wellbeing were i) roster compression, identified by [Henry et al. \(2013\)](#), and ii) the number of hours worked per day, identified by [Peetz et al. \(2012\)](#). Bullying, shift-work and perceived work control also appear to be job demands linked to FIFO employee mental health, yet these are not selected variables for the current research as the outcome is predictable based on comprehensive research in other work contexts. The effects on FIFO employees' depression, anxiety and stress will depend to some extent on individual differences and their (subjective) appraisal of whether work conditions are stressful (Hobfoll, 2001). Yet how and to what extent working conditions effect psychological wellbeing are likely to vary depending on the worker's specific environment and job demands. The current assessment of FIFO mining employee depression, anxiety and stress symptoms and the effects of various job-related factors was designed to gauge the psychological wellbeing of the FIFO workforce, predicated on the following hypotheses:

Hypothesis 1a: Depression, anxiety and stress symptoms are higher among employees on high compression rosters compared with those on lower compression rosters.

Hypothesis 1b: Depression, anxiety and stress symptoms are higher among employees who work longer days compared with those working shorter days.

4.5 Adjustment

Adjusting to change is a fundamental requirement for individuals to navigate their working lives. Today, changes in employment occur more frequently than ever before and have important repercussions for organisations ([Neffke & Henning, 2013](#)). In psychological research, adjustment refers to both an outcome and a process. As an outcome, psychological adjustment indicates positive or negative mental health; and as a process, it indicates how effectively an individual is able to cope with environmental demands and associated stress. Accordingly, as a process, psychological adjustment indicates how well an individual adapts to changing environmental conditions. Much of the previous research on adjustment measured individuals' responses to a stressful event (for example, [Nieuwenhuijsen, Bruinvels, & Frings-Dresen, 2010](#); [Van der Bank & Rothmann, 2006](#)).

The ease with which an employee adjusts to a work position depends largely on how familiar they are with the conditions associated with the role and the workplace culture, such as company policies, values and norms ([Black, Mendenhall, & Oddou, 1991](#)). The work undertaken by FIFO employees (e.g., truck driving) may be similar to previous roles, but the context of that work in remote areas of Australia may require substantial adjustment. [Behr \(2012\)](#) identified several factors unique to FIFO employees. Larger work sites and longer work hours, as well as spending extended periods with work colleagues appeared to aggravate interpersonal problems and bullying ([Carter & Kaczmarek, 2009](#); [Miller, 2014](#)). Since FIFO mining workers come from a multitude of origins, a greater degree of diversity between employee norms and values may have manifested than if they originated from a single geographic location, potentially leading to communication difficulties ([Black & Gregersen, 1991](#)). [Behr \(2012\)](#) observed the FIFO workplace culture was inclined to perceive expressions of emotion as weakness, with little sympathy for individuals experiencing adjustment difficulties. Feelings of isolation may therefore be heightened for FIFO mining workers who find themselves removed from their usual social supports ([Pirotta, 2009](#); [Wicks, 2002](#)) and steeped in a masculine culture of violence, aggression, risk taking and competitiveness ([Carter & Kaczmarek, 2009](#); [Wicks, 2002](#)). A further difficulty may be socialising, since many FIFO workers are employed on different roster compressions that potentially hinder establishing friendships and intensify feelings of isolation ([Torkington et al., 2011](#)). While personal and interpersonal difficulties affect adjustment, physical conditions,

including the weather (high temperature, humidity) ([Maté & Oosthuizen, 2012](#)), housing (small bedroom, minimal personal space), and food (eaten in a common “mess hall”) also require getting used to ([Behr, 2012](#); [WA Education and Health Standing Committee \(final report\), 2015](#)). Any of these factors, alone or in combination, can cause adjustment difficulties for FIFO employees, and given the not insignificant differences between FIFO and other workplace conditions, it is probable that FIFO employees experience more difficulties adjusting than would generally be expected ([Behr, 2012](#); [Vojnovic et al., 2014](#)).

The research clearly suggests that the adjustment of FIFO employees to their working arrangements can affect their mental health (e.g., [Bowers et al., 2018](#); [Henry et al., 2013](#)). However, this relationship has not been measured. A study by [Behr \(2012\)](#) explored the concept of FIFO employee adjustment, but not in relation to psychological wellbeing. Instead, she examined the relationships between cultural adjustment, the locus of control and commitment to the employing organisation of 227 FIFO mining employees. Her findings indicated that high internal locus of control was related to high affective commitment and high cultural adjustment. The study also found a connection between high cultural adjustment and high affective commitment. Overall, the results indicate that cultural adjustment has important organisational outcomes for FIFO workers, yet little is understood about its effects on employee psychological wellbeing. Linked to research question two, understanding the adjustment to FIFO working arrangements and its effects on the psychological wellbeing of FIFO workers was guided by the following hypothesis:

Hypothesis 2: Adjustment levels are higher among employees with lower depression, anxiety and stress symptoms compared to those with lower levels of adjustment.

4.6 Help-Seeking

In this thesis, help-seeking follows the definition of [Rickwood and Thomas's \(2012, p. 180\)](#) meta-analysis of the help-seeking literature as: “an adaptive coping process that is the attempt to obtain external assistance to deal with a mental health concern”. The Process Theory of Help-Seeking, supported by sound empirical evidence (see, for example, [Davies, 2015](#); [Rickwood et al., 2007](#)), was usefully applied to the FIFO mining employment context. Past approaches have

included assessing help-seeking, predominantly by measuring willingness, attitudes and/or intentions to help-seeking.

The consequences of mental disorders on employees and organisational performance have been shown to incur a host of negative outcomes, such as increased absenteeism, accidents at work, and decreased productivity ([Bailey, Dollard, McLinton, et al., 2015](#); [McTernan et al., 2013](#)). For employees, not seeking help early can lead to increased symptom severity ([Britt & McFadden, 2012](#); [Rickwood et al., 2007](#)), occupational impairment, suicide, health-risk behaviours and disrupted family relationships ([Tanielian et al., 2008](#); [Zinzow et al., 2012](#)). Conversely, early prevention and treatment have demonstrated success in reducing the long-term effects of a number of mental health problems ([Rickwood et al., 2007](#)), highlighting the importance of promoting help-seeking behaviour. To do so, it is necessary to better understand the underlying processes and antecedent factors that affect employee help-seeking. Several empirical studies have identified the impact of adverse employment conditions on psychological wellbeing, but few have explored the antecedent factors that influence employees to seek help ([Britt & McFadden, 2012](#)). Even fewer studies have researched employee preferences for such help, and to date, help-seeking studies have lacked conceptual clarity and unified measurement ([Rickwood & Thomas, 2012](#); [Wilson, Svenson, & Caputi, 2013](#)).

Historically, receiving mental health treatment at work has been viewed as an employer initiative, rather than an employee one. In a work context, mental health treatment grew from an action initiated in the late 1800s, when companies sought to restrict employees from consuming alcohol at work (reportedly a common practice at the time) to increase productivity. In the 1930s, EAPs were created to address employee alcohol problems and associated company costs ([Brody, 1988](#)). From a company perspective, EAPs were intended to reduce problems for workers, but in practice, they were used punitively and as justification for firing “troubled” employees ([Brody, 1988](#)). Current EAPs and related health promotion programs have been criticised for serving company rather than employee interests ([Goetzel et al., 2014](#)) and many employees have reported concerns about confidentiality and potentially negative career impacts. This appears to be enhanced in roles with a legal requirement for employees to report mental health diagnoses and medications that could affect their safety, such as military personnel ([Britt & McFadden, 2012](#)). Concerns about EAPs were also reported by [Henry et al. \(2013\)](#) among FIFO employees in the Australian mining industry. Given the structural and attitudinal barriers to initiating mental health treatment (see the previous Chapter), it is not surprising that stigma and discrimination in

conjunction with confidentiality and career concerns deter many employees from disclosing mental disorders to their employers.

There is a well-established dichotomy between the prevalence of mental health problems and the number of individuals who seek help ([Andrade et al., 2014](#); [Rickwood & Thomas, 2012](#)). This was observed on a global scale after analysis of World Health Organisation data, indicating that out of 63,678 individuals in 24 countries, 18 per cent of those who met the criteria for a 12-month mental disorder reported they had not used mental health services during that time ([Andrade et al., 2014](#)). The same effect was seen in Australia, where only 34 per cent of individuals with a mental disorder accessed formal support services ([Slade et al., 2009](#)). Identifying barriers to care, such as attitude and stigma, does not explain the underlying intra-personal factors (e.g., negative attitude to help-seeking caused by stigma) and how that relationship changes under various conditions.

A less researched area in the help-seeking literature is the preference of individuals for formal versus informal support and the conditions that influence this inclination. In a systematic review by [Rickwood and Thomas \(2012\)](#) of 316 studies on help-seeking, the majority (66 per cent) assessed only formal help-seeking, while substantially fewer (32 per cent) assessed both formal and informal help-seeking. Rickwood and Thomas found depression, psychological distress and emotional problems were the most common mental health issues investigated in the help-seeking literature, in addition to research that required a simple “yes” or “no” answer from participants in response to whether they were experiencing a “mental disorder”. To better understand how adjustment, psychological wellbeing, stigma and help-seeking relate, it is important to assess whether stigma simply provides a barrier to help-seeking as established by prior research or whether it actually has a mediating effect as has been more recently suggested by Vogel et al. (200). It is also relevant to understand if this effect differs depending on what kind of problem is faced by the employee to identify antecedent factors that promote or inhibit help-seeking. Therefore, this will be tested under both an emotional problem level and a suicidal thoughts level. Linked to the second research question and in light of the above discussion therefore, understanding the differences between help-seeking approaches among the FIFO workforce was guided by the following hypotheses:

Hypothesis 3: Levels of help-seeking intentions for emotional problems will be higher among FIFO employees with lower levels of depression, anxiety and stress symptoms when compared with levels of help-seeking intentions for suicidal thoughts.

Gender has been systemically related to help-seeking behaviour in a large number of earlier studies, supporting the view that males are more reluctant than females to seek either formal or informal support (for example, see [Hammer, Vogel, & Heimerdinger-Edwards, 2013](#); [Rickwood & Thomas, 2012](#)). This was partly attributed to masculine norms linked to stigma that, in turn, influenced intentions of help-seeking, particularly prevalent among men in rural areas ([Hammer et al., 2013](#)). Also linked to the second research question, understanding the differences in help-seeking behaviours between genders led to the following hypotheses:

Hypothesis 4a: The preference for informal help-seeking will be higher among males compared to females.

Hypothesis 4b: The preference for formal help-seeking will be higher among females compared to males.

Research on help-seeking amongst FIFO mining employees indicated a preference for accessing informal, rather than formal supports ([Henry et al., 2013](#)), a prevalent use of unhelpful coping strategies ([Henry et al., 2013](#); [Keown, 2005](#)), low levels of emotional literacy and poor stress symptom recognition ([Torkington et al., 2011](#)). [McTernan et al. \(2016a\)](#) investigated how co-worker support among FIFO mining industry employees differed from other Australian industries. The findings revealed that co-worker support acted as a significant buffer for work-family conflict and had a protective effect on depression. This result was not found to be significant in the general working population and underscored the importance of informal co-worker support for buffering negative effects in the mining industry. This current assessment of FIFO employee help-seeking intentions and preferences and their relationships to different mental health problems therefore provides a valuable piece of the puzzle.

4.7 Mental Health Stigma

Stigmatised attitudes in the workplace can lead to discrimination, such as denial of employment opportunities ([Stuart, 2006](#); [World Health Organisation, 2014](#)) and promotion, and being considered unsafe by management and co-workers. Empirical research has demonstrated that stigma significantly mediates the relationship between help-seeking attitudes, intentions and behaviour (Wade et al., 2015). Stigma has also been identified as a strong predictor of help-seeking decisions in relation to mental health problems (Vogel, Wade, & Hackler, 2007). Evidence

suggests the effect of stigma on help-seeking is strongest from within individuals' social networks, including family, friends and co-workers ([Vogel et al., 2009](#)), and suggests that people who engage regularly play a more important role than wider society in shaping one another's values and decisions about seeking help. This is an important finding because it signals the possibility that FIFO employees, in close physical proximity for extended periods of time, have the capacity to influence each other's values and perceptions of mental health and help-seeking. The effect of subjective norms has also been noted among military personnel and recognised for its similarities with the male-dominated workplace of the Australian mining industry ([Carter & Kaczmarek, 2009](#)) and its culture ([Behr, 2012](#); [Sibbel, 2010](#)). It is now widely accepted that negative beliefs about mental health treatment are likely to be enhanced by the value placed on emotional strength in work settings ([Nash et al., 2009](#); [Vogt, 2011](#)), fuelled by the prevailing belief that individuals make conscious, rational decisions to be strong, tough and resilient ([Nash et al., 2009](#)) or weak, vulnerable and sensitive. Male-dominated workplaces are reportedly more susceptible to negative beliefs about mental health treatment ([Vogt, 2011](#)), with the implication that the perceptions of such workplace cultures are inclined to be stigmatised, leading to low help-seeking for mental health. Nevertheless, the role of workplace culture in the relationships between mental health, stigma and help-seeking have not been assessed by existing scales, a gap that has been identified by other researchers ([for example, see Zinzow et al., 2012](#)). In general, limitations of the literature on stigma include its reliance on cross-sectional data, limited inferences and potential for common method bias. Previous studies on stigma focused predominantly on depression, followed by severe mental illness and psychosis, self-harm and anxiety disorders ([Clement et al., 2015](#)). Literature supports that the experience of stress attracts lower perceptions of stigma than does depression ([Vogel et al., 2009](#)). The literature review for this thesis did not identify any studies that have explored the relationships between stigma and work-related suicidal ideation with cultural adjustment.

Prior research has indicated that perceived stigmatised beliefs about mental health and treatment inhibited help-seeking among individuals experiencing psychological distress ([Fertout et al., 2015](#); [Jennings et al., 2015](#)). In Chapter 3, attitudinal barriers to care were established as a primary barrier to help-seeking and a greater barrier to those experiencing mild to moderate mental health problems than structural barriers ([Andrade et al., 2014](#)). Conceptually, such barriers can impair help-seeking at different stages: stigma can interfere cognitively in steps 1 and 2 and behaviourally in steps 3 and 4. Structural barriers to care (e.g., availability of services in remote

locations, lack of time to visit a doctor/counsellor) can interfere with steps 3 and 4. The ways in which these barriers impair the help-seeking process is depicted in Figure 4.5.

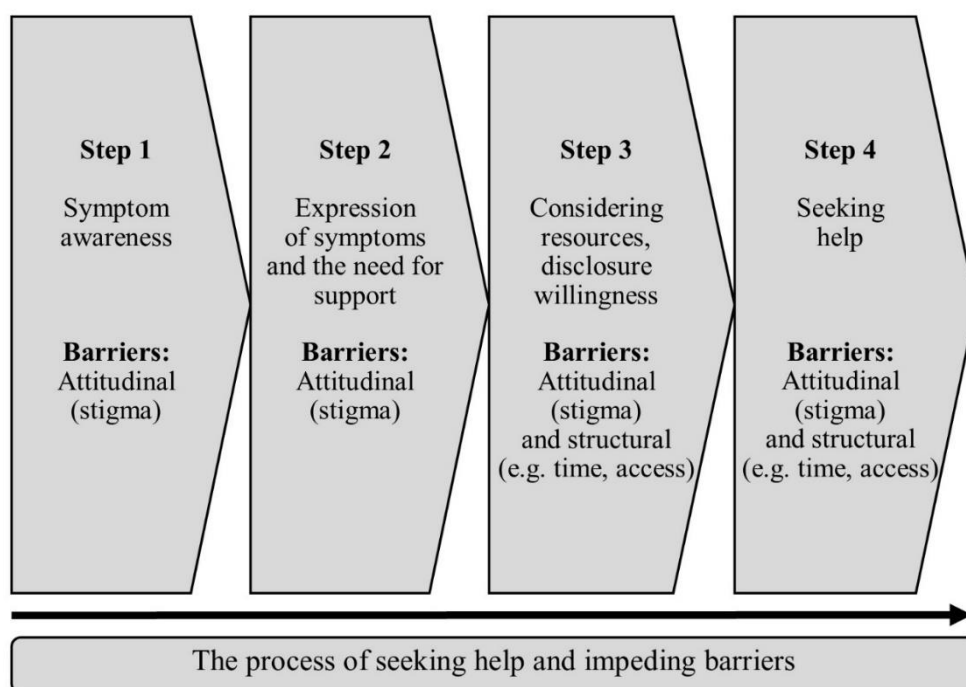


Figure 4.5 The Process of Help-Seeking and Related Barriers. ([Adapted from Rickwood et al., 2005, p. 8](#)).

Stigma has been identified in previous mental health research on FIFO employees as a substantial barrier to help-seeking ([Bowers et al., 2018](#); [Henry et al., 2013](#)). However, no research was identified in the review of the extant literature that empirically examines levels of stigma or help-seeking among the Australian FIFO mining industry workforce. Further, while the evidence suggests that stigma is an important barrier to help-seeking, the complexities of this relationship for different mental disorders, under different conditions (e.g., emotional problems versus suicidal thoughts) and the role of adjustment are arguably not well understood.

Previous research into the effects of psychological distress, stigma, help-seeking ([Lannin et al., 2015](#); [Vogel et al., 2009](#)) and the relationships between these variables and job demands ([Britt et al., 2008](#)) identified mediation effects in their models. Although the effects of adjustment, psychological distress and stigma have not been tested in the literature, [Vogel and Wade \(2009\)](#) speculated that an effect may exist because co-workers influence one another's perceptions of stigma. The following relationships were therefore assessed for mediation effects:

- Stigma of psychological distress and help-seeking (emotional problems); and

- Stigma of psychological distress and help-seeking (suicidal thoughts).

This is consistent with [Britt et al. \(2008\)](#) recommendations who suggested assessing both barriers to care and stigma as moderators to the stressor-strain relationship between the working environment. He also emphasised the development of interventions to concurrently reduce stigma and remove barriers to care. Employing a moderated mediation analysis will investigate if job demands moderates the likely relationship between psychological wellbeing to stigma and help-seeking. The hypothesized relationships are graphically presented in Figure 4.6.

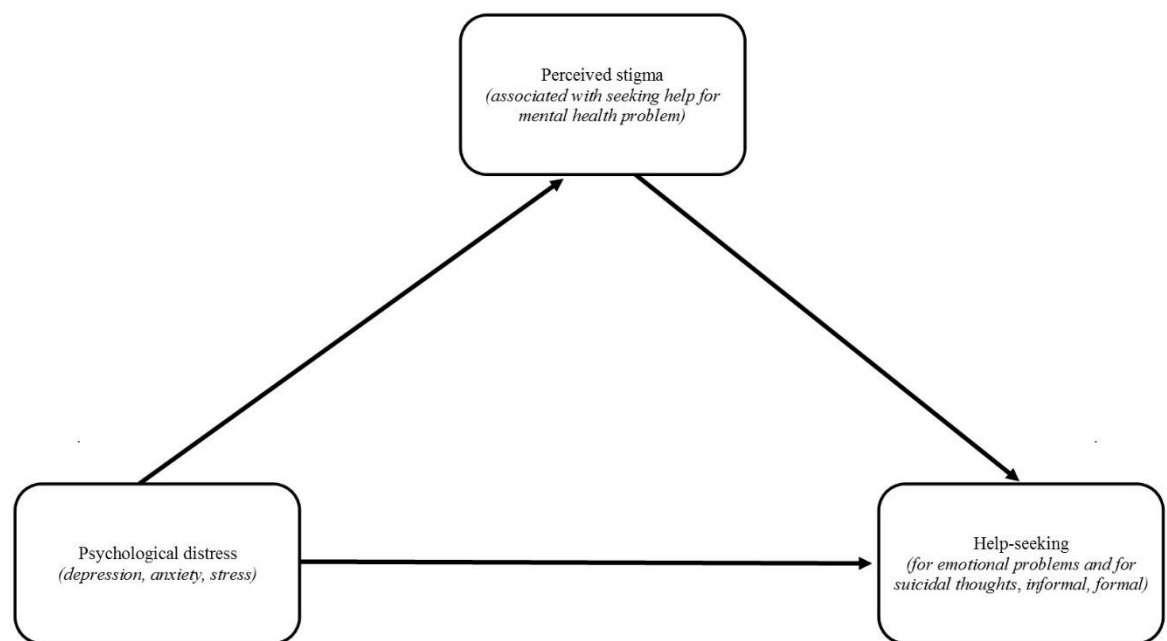


Figure 4.6 Hypothesised Mediation of Stigma.

Linked to the second research question, the current study was aimed at extending our understanding of the association between psychological wellbeing, adjustment, stigma and help-seeking, and was based on the proposition that there will be differences in the perceived levels of stigma between different mental disorders and that stigma mediates the relationship between mental health and help-seeking. Gender differences were also examined. These objectives were guided by the following hypotheses:

Hypothesis 5: Higher levels of stigma will be perceived among FIFO employees with higher levels of depression, anxiety and stress symptoms compared to those with lower symptoms.

Hypothesis 6: Higher perceptions of stigma will mediate the negative effect of psychological distress and help-seeking.

4.8 FIFO Working Conditions

Identifying the antecedent factors related to the mental health of the FIFO workforce is crucial for determining prevention strategies. As discussed in Chapter 3, good mental health in the workforce can positively affect employee health and organisational outcomes ([Cameron, 2012](#); [Luthans, Youssef, et al., 2007](#)). Conversely, poor mental health can negatively affect employee health and organisational outcomes through reduced productivity, lowered performance and increased insurance claims for mental strain ([Law et al., 2011](#)). As also discussed in Chapter 3, the JD-R/PSC models enabled identification of the negative effects of job demands on employee mental strain. The link between working conditions, depression ([Hall et al., 2013](#)) and stress ([Demerouti et al., 2009](#)) has been well established in empirical research; however, less is known about the effects of working conditions on symptoms of anxiety. Demerouti et al., (2009) found anxiety symptoms related to different working conditions than depression and stress symptoms, for example, low work control was related to depression, while harassment was related to anxiety.

Job demands have been demonstrated to influence the mediating effects between cognitive processes (Ng et al., 2008). In one instance, leader's perceived capabilities to perform leader roles was found to mediate the relationships between personality traits with leader effectiveness. Moderated mediation analyses further demonstrated that leader's perceived capabilities mediated the relationships for all three personality variables for only those leaders with low job demands (Ng et al., 2008). Such empirical evidence supports the concept that the strength of the relationships between perceptions of stigma and the internal help-seeking processes may differ between employees who are situated in different job contexts with different job demands. Extending this logic, it is anticipated that FIFO related job demands will have a moderating effect on the relationships between adjustment, psychological wellbeing, stigma and help-seeking. Employing a moderated mediation analysis will investigate if job demands moderates the likely relationship between psychological wellbeing to stigma and help-seeking. The hypothesized relationships are graphically presented in Figure 4.7.

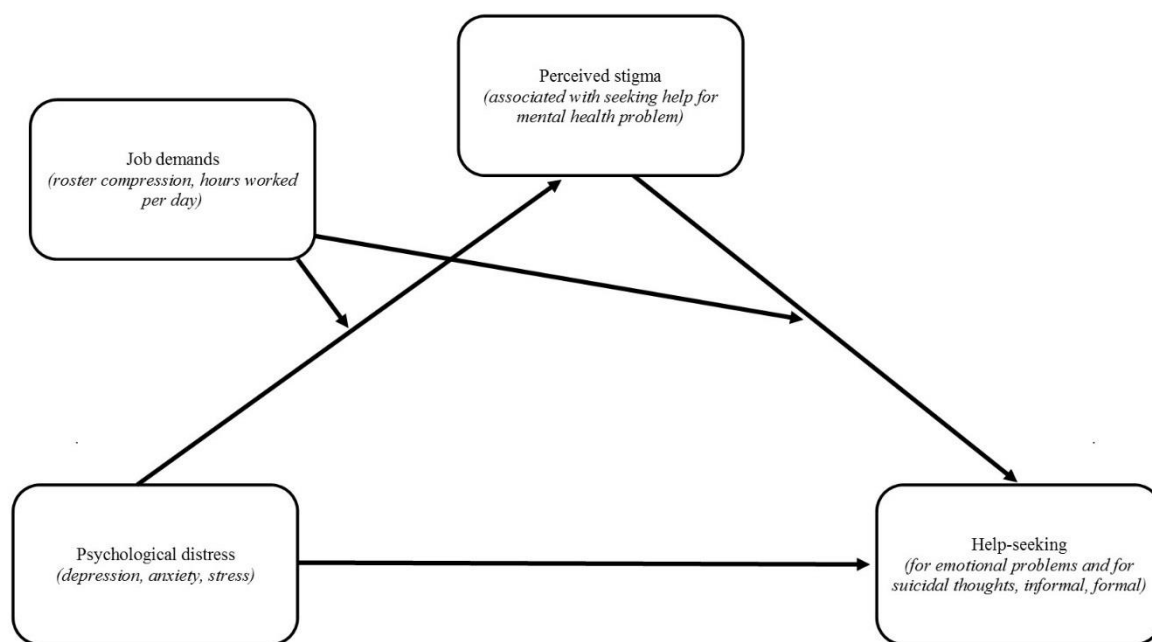


Figure 4.7 Hypothesised Moderation Effects of Job Demands.

As previously noted in Section 4.4, earlier FIFO psychological health studies highlighted the effects of job demands on the mental health of the FIFO workforce (see [Clifford, 2010](#); [Henry et al., 2013](#); [Peetz et al., 2012](#)). Linked to the third research question, the current research was aimed at understanding how FIFO work conditions influenced the relationships between adjustment, psychological wellbeing, stigma and help-seeking among FIFO employees, based on the following hypotheses:

Hypothesis 7a: Higher roster compression will strengthen the negative effect of stigma on psychological distress and help-seeking.

Hypothesis 7b: Longer working hours a day will strengthen the negative effect of stigma on psychological distress and help-seeking.

4.9 Developing a Model

This chapter has outlined the anticipated relationships between the processes of FIFO employee mental health, cultural adjustment, stigma, help-seeking and working conditions. The

study was focused on increasing our understanding of these relationships in the context of FIFO employment, with a view to providing both theoretical and practical contributions. A conceptual model was developed to include the key constructs, viz., mental health, cultural adjustment, help-seeking, mental health stigma and FIFO working conditions, and was used to empirically examine the research questions and hypotheses. The model shown in Figure 4.8 below outlines the hypothesised relationships.

4.10 Conclusion

In this study, empirical evidence will be collected and analysed on the Australian FIFO mining industry workforce to provide information about incidences of psychological wellbeing/distress and help-seeking behaviours. The research focuses on the extent of the mental health problems experienced and the interrelationships between different mental health and help-seeking dimensions, and assesses how FIFO working conditions affect psychological wellbeing and help-seeking behaviours. The theories of TPB and the Process Theory of Help-Seeking are employed to better understand how FIFO employees become aware of their own mental health problems and subsequently engage with support. Weaknesses in each theory are arguably mitigated by the other; and the JD-R model assists in clarifying how working conditions in the FIFO context affected psychological wellbeing and help-seeking. A conceptual model was developed to inspect relevant personal, social and employment factors influenced by workplace conditions, and included the key variables of adjustment, psychological wellbeing, stigma, help-seeking and working conditions. The theoretical and practical implications of the model crystallised into three research questions and seven hypotheses that will subsequently be empirically examined.

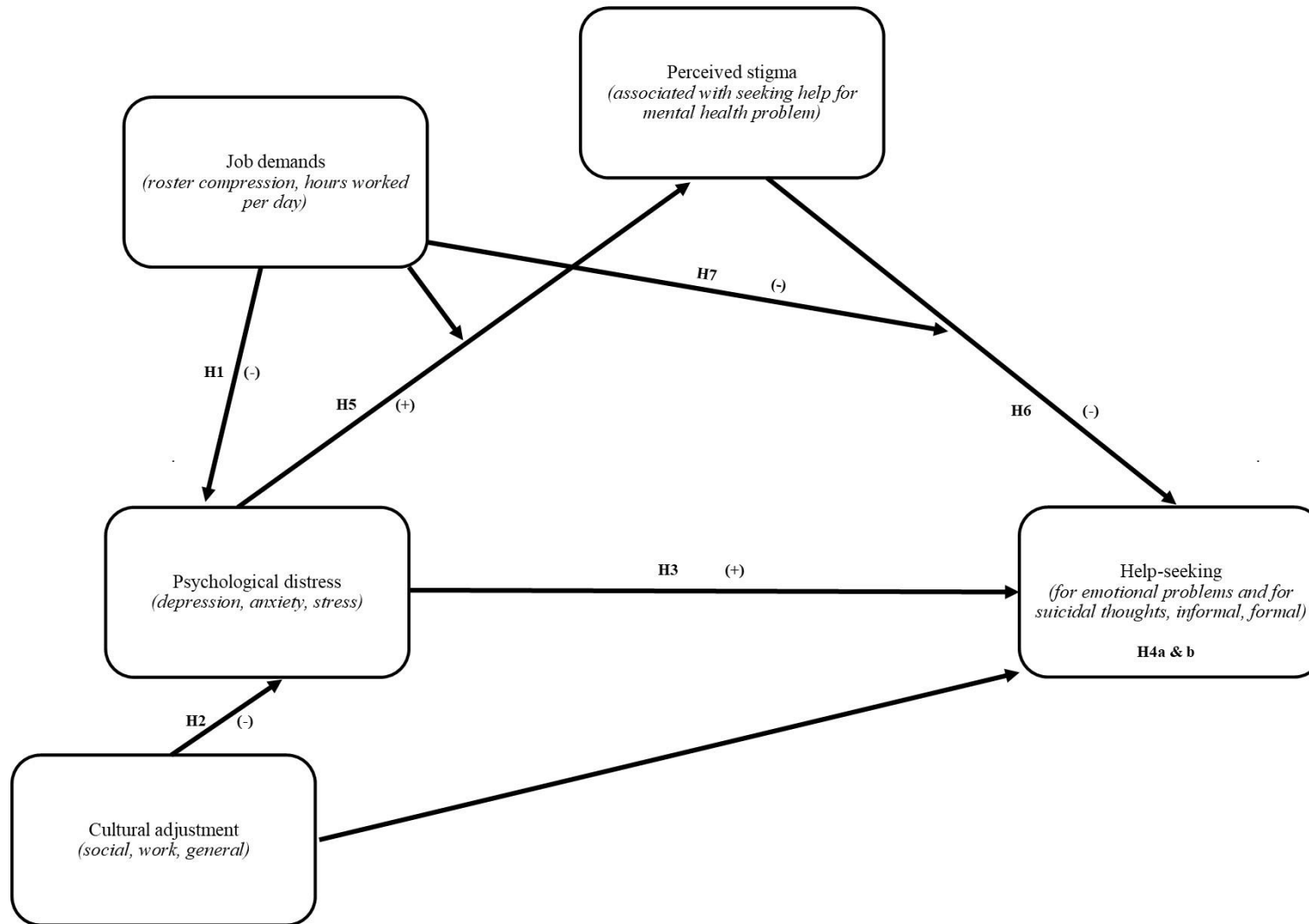


Figure 4.8 Psychological Wellbeing and Help-Seeking Model

Chapter 5 – Methodology

5.1 Introduction

The previous chapters collectively contextualised the study and presented a review of the literature and theoretical framework. In particular, it outlined the use of the Theory of Planned Behaviour and the Process Theory of Help-Seeking, simultaneously drawing on concepts from the Job Demands-Resources model. This chapter presents and justifies the methodology and data analysis, and explains each step of data sampling, data collection and analysis. This chapter commences with an overview of the research design and then discusses construction of the sample, followed by a summary of the participants' demographic characteristics. The measures used in the survey and how they were scored or rated are described, as is the process of a sequential research design. This is followed by the final section that provides a rationale for the data-analysis techniques. The chapter provides a solid argument for the use of Structural Equation Modelling (SEM) to explore the relationships between FIFO employees' psychological wellbeing and help-seeking experiences. Some information provided in this chapter regarding participants, measures and procedures was previously reported by the author in [Vojnovic and Bahn \(2015\)](#) and [Vojnovic et al. \(2014\)](#).

5.2 Research Design

The study assessed the incidence of psychological wellbeing among FIFO employees to better understand how they engaged in help-seeking behaviours in the context of the Australian mining industry. The research objectives included gauging the extent to which FIFO mining employees experienced psychological distress, examining the interrelationships between different mental health and help-seeking dimensions, and examining the influence of FIFO working conditions on these. The study gathered and analysed evidence via an empirical, self-reporting survey (the full survey questionnaire is provided in Appendix 2). The research design employed a correlational quantitative analysis assessed by SEM. Levels of adjustment, psychological distress, stigma and help-seeking were gauged using validated measures (elaborated on in section 5.5). The relationships between these processes and the influence of job demands were also examined by means of SEM. As noted in Chapter 3, previous research on FIFO employee mental health is limited and predominantly informed by small sample sizes, often drawn from only one location or

mining company. To adequately address this study's research questions, a large-scale study was necessary.

Theoretically, the study is situated in the field of Occupational Health Psychology, so TPB and the Process Theory of Help-Seeking formed the underpinning framework to best understand how FIFO employees became aware that they were experiencing a mental health problem and how they acted or behaved with regard to accessing support. TPB proposes that an employee's help-seeking intention first involves their awareness of a problem ([Zemore & Ajzen, 2014](#)), and accordingly, FIFO employees' help-seeking behaviours may be best understood by assessing help-seeking intentions. The theoretical orientation was complemented by the Process Theory of Help-Seeking ([Rickwood et al., 2005 & Ciarrochi, 2005](#)), comprising an individual's knowledge, attitudes and beliefs concerning available help sources. Help-seeking behaviours of FIFO employees are also likely to be influenced by organisational factors, available supports and workplace culture, so the JD-R model was used to comprehend the influence of FIFO working conditions on both psychological wellbeing and help-seeking. In addition to job demands and psychological distress, this research also incorporated the constructs of adjustment, stigma and help-seeking.

5.3 Participant Sample

5.3.1 Theoretical Considerations

The sampling method and ability of the sample to reflect the characteristics of the population of interest are central research considerations (Highhouse & Gillespie, 2009; Shen et al., 2011). Sample characteristics are important to ensure the stability and replicability of the research findings are grounded in the research design; the likely effect size of the phenomena under study; and generalisability across situations and occupations ([Shen et al.](#)). Sample characteristics are particularly important in studies that focus on a clearly-defined population of interest, (e.g., a particular occupation group) ([Kardes, 1996](#)). However, this is in contrast to psychological process research. [Highhouse and Gillespie \(2009\)](#) concluded it is unimportant for a sample to reflect the characteristics of the population of interest in psychological process research, because psychological effects are always generalisable (e.g., personality theory) and remain relatively robust across location, employment status and age ([Boyce et al., 2015 & Sedikides, 2015](#)). Hence, the requirement for sample characteristics to reflect the population of interest for testing theoretical psychological processes, such as stigma, may not always be as critical ([Shen et al., 2011](#)). A

representative sample was considered necessary for this study, given its focus on a particular group (Australian FIFO mining industry employees).

5.3.2 Survey Participants

Participants in the survey were employed on a FIFO basis in the WA mining industry. An online link to the survey was circulated via industry newsletters and social media posts, and an invitation to FIFO workers was published in a West Australian newspaper. Surveys were physically distributed by the researcher during a site visit at two locations. Of the 642 survey responses received, 13 were discarded for being incomplete, leaving a total of 629. Due to the analysis technique chosen, the sample was further reduced to 599.

The survey data were inspected for univariate and multivariate outliers, missing values and patterns of missing values. The majority of survey results ($N = 516$) were drawn from the online survey, designed on a web-based survey-collection software “Qualtrics”. A total of 21.1 per cent ($N = 126$) surveys were completed by participants in hard copy and collected from participants during the two site visits. The hard copy data were entered manually into Qualtrics, and used “forced response” for certain questions, whereby participants were unable to progress to the next question before providing an answer to the current one. Any missing values in the data set therefore originated from the hard copy surveys. Multivariate outliers were removed using listwise deletion (Bagozzi & Yi, 2012). Of the remaining responses, 629 were valid for analysis, using the DASS-21 for detecting individual differences (drawn from the demographic information collected in the survey) and scrutinising the direct effects of job demands. There were missing values ($N = 30$) in three of the other measurement scales, viz., AAS, GHSQ and PSOSH, leaving a total of 599 cases that were considered valid for analysis. Participants’ demographic information is presented in Table 5.1 below.

The age and gender of the sample were consistent with a representative profile of the FIFO workforce, i.e., relatively young and the majority aged between 25 and 44 years. The sample also reported relatively low education levels, in line with other Australian mining industry samples ([Bahn, 2014](#); [Henry et al., 2013](#)). Those with secondary-school qualifications and below comprised nearly 36 per cent of the sample and predominantly worked in manual labour roles. The largest group, making up around 44 per cent of the sample, had achieved a trade/vocational qualification. Census data show that FIFO workers commonly attain a non-school (often trade) qualification and are less likely to attain a university qualification compared to the general population. The level of formal qualifications in the current sample was also consistent with the 24 per cent reported by

Henry et al. (2013), with 20 per cent holding tertiary level qualifications. In general, the sample can be described as predominantly young males with low levels of formal education.

Table 5.1 *Participants' Demographic Information*

Variable	Mean (SD)	Median	Number	%
Gender				
Male			522	83.0
Female			107	17.0
Age	36.8 years (SD=10.34)	35.00		
18-29			185	29.6
30-39			206	32.9
40-49			148	23.6
50-59			76	12.1
60-70			11	1.8
Education				
Secondary school and below			224	35.7
Vocational (TAFE/trade)			279	44.4
Tertiary (university degree)			125	19.9
Living arrangements				
Partner and children			246	39.2
Partner and no children			175	27.9
Single with children			16	2.5
Single with no children			134	21.3
Other			57	9.1
Years of FIFO experience	M=6.79, (SD=5.77)	4.83		
0-3.5 years			219	34.8
3.6-8 years			221	35.5
>8 years and over			187	29.7
Years in current job	M=2.05, (SD=0.79)	2.25		
0-1 year			163	25.9
1.1-3 years			235	37.4
>3 years and over			231	36.7

Table adapted from Vojnovic and Bahn, 2015.

In terms of living arrangements, the largest category of participants resided with a partner and children, just over 39 per cent, but when this figure was combined with partner and no children, over two-thirds of the sample were in a family or family arrangement. The number of years spent working on a FIFO basis ($M = 6.79$, $SD = 5.77$) ranged from less than a year up to 36 years, yet the time in their current jobs ($M = 2.05$, $SD = 0.79$) were markedly less, with 63 per cent reporting they had held their current job for less than three years. The biggest proportion of the sample, nearly 42 per cent, had accrued between 3.5 and 8 years of FIFO mining work experience.

In order to increase the generalisability of the findings, the selection procedure captured a wide distribution of individuals and occupations. Participants were from 143 different employer companies; the most frequently reported are shown in Table 5.2. BHP employees comprised 9 per cent, while Rio Tinto employees made up 7 per cent of the sample. Other companies were also well represented, including Woodside (8 per cent), Fortescue Metals Group (FMG) (4 per cent), MACA (3 per cent) and Anglo Ashanti Gold (2 per cent). The largest number of participants was from a company where the researcher conducted two different site visits. The company managers requested the researcher keep their identity confidential; therefore the company is referred to as “MineCo”, with the location of the first site visit labelled “MineCo A” and the second site visit at a different location labelled “MineCo B”. Participants from the two anonymous companies totalled just over 21 per cent of the total sample, and the remaining 135 companies included contracting and services companies, boutique firms and specialised organisations, such as engineering. It should therefore be noted that the sample is skewed towards a substantial number of participants from the company visited by the researcher and a majority of participants working in large firms.

Table 5.2 *Employing Companies of Participants*

Employing company	%	Frequency (N = 610)
MineCo A	14.4	88
BHP Billiton	9.7	59
Rio Tinto	8.1	49
MineCo B	6.6	40
Woodside	8.4	51
FMG	4.9	30
MACA	3.6	22
Anglo Ashanti Gold	2.1	13
Other	42.1	257

An independent-samples t-test was conducted to compare whether there were significant differences between psychological wellbeing for participants who completed the survey via hard-copy ($N=88$) compared to on-line ($N=540$). There were no significant difference in the scores for the hard copy ($M=8.27$, $SD=7.09$) and on-line ($M=8.84$, $SD=8.34$) survey conditions; $t(626)=-6.04$, $p = 0.54$. These results suggest that the method of data-collection did not have an effect on the results.

The geographical locations of the participants' worksites were categorised into eight regions as displayed in Figure 5.1. The majority worked in the Pilbara region (42 per cent), followed by the Goldfields/Esperance (23 per cent), midwest (13 per cent), offshore (11 per cent), Kimberley (3 per cent), Gorgon Island (3 per cent), Gascoyne (2 per cent) and South Western Australia (Wheatbelt/Great Southern) (2 per cent). The sample is broadly consistent with Australian census data ([Australian Bureau of Statistics, 2013](#)) distribution of resource industry extraction locations across WA. The researcher's two site visits were conducted in the midwest, accounting for the greater proportion of participants from that sub-region.

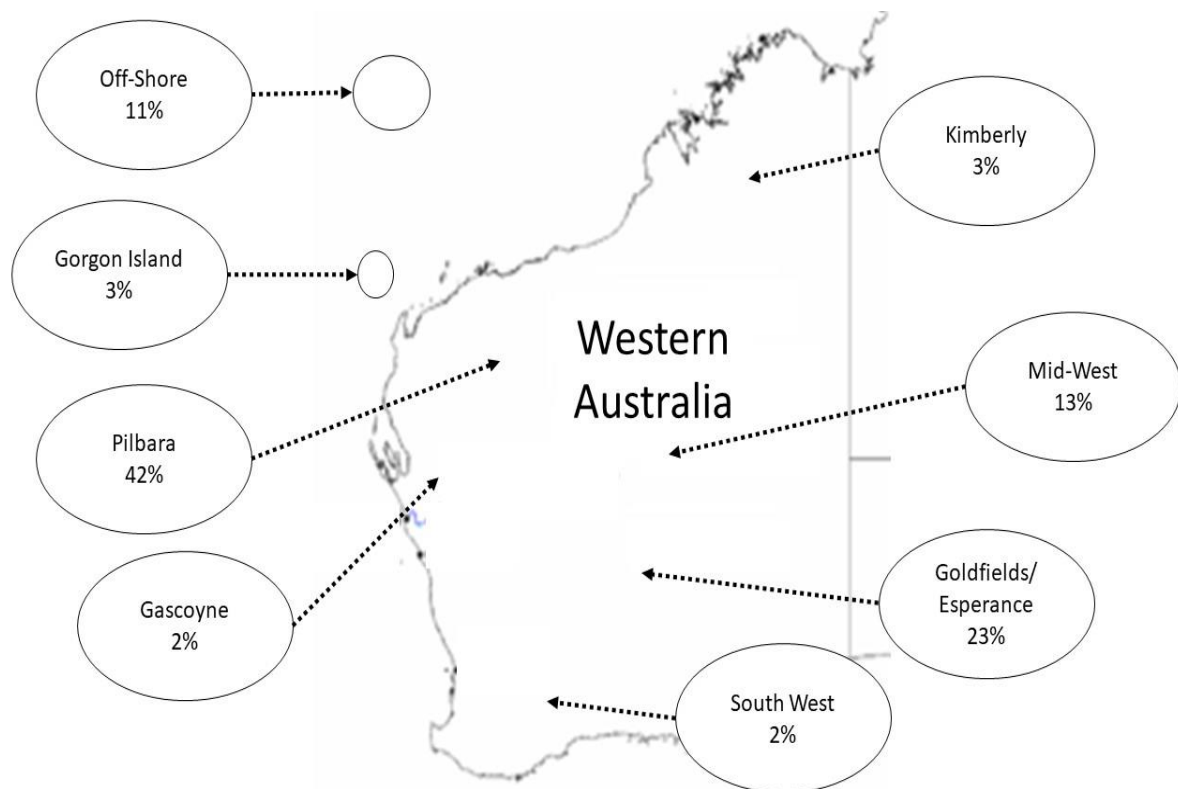


Figure 5.1 Geographical Employment Regions of Participants

At the time of data collection in 2014, the average weekly ordinary time earnings for an Australian full-time adult was \$1,453.90 ([Australian Bureau of Statistics, 2014b](#)). In contrast, the ABS data show that those employed in the mining industry had the highest full-time adult average weekly ordinary time earnings in Australia at \$2,493.20. The majority of participants in this study reported weekly remuneration of between \$1,500 and \$2,499 (59 per cent), \$2,500 or more (28 per cent), and the smallest category earned less than \$1,500 per week (14 per cent). This indicates

that the sample's remuneration was consistent with mining industry norms and well above the Australian average.

Participants in management roles comprised 22 per cent of the sample, and non-managerial or supervisory roles made up 78 per cent. Since participants self-selected their roles, it is possible that employees with lower levels of management experience (i.e., shift supervisors) included themselves in the managerial category. The vast majority of participants were employed on a permanent or fixed term (94 per cent) basis compared to casual workers (6 per cent).

5.4 Procedures

The Human Research Ethics Committee at Edith Cowan University approved the research (approval number 9590) that was conducted according to the guidelines in the National Statement on Ethical Conduct in Human Research [National Statement on Ethical Conduct in Human Research \(2007 updated 2015\)](#). The information required to gain ethics approval is shown in Appendix 3. All participants involved in this research provided their consent and no participants elected to withdraw. (*Note: the author transferred from being enrolled in a PhD degree at Edith Cowan University in Perth to Macquarie University in Sydney in 2016 as a result of the principal supervisor taking up a new academic post there. At the same time, the enrolment status changed from a full-time to part-time student*).

5.4.1 Survey Procedure

Participants completed anonymous online and hard-copy questionnaires over a six-month period between July 2014 and January 2015. The study was explained to mining resource companies, contacted via their Work Health and Safety or Human Resources departments, and they were asked to distribute the survey to their employees. In addition, social and print media (e.g., The Safety Institute of Australia's "OSH Professionals Magazine") were used to recruit participants by informing readers of the study and providing an online link to the survey. The researcher also distributed the survey in person at two FIFO workplaces in remote WA locations. Snowball sampling took into account minimal inconvenience and maximum participation. The survey was completed at morning and evening safety meetings, where the purpose of the study and participants' rights to confidentiality were explained. While not compulsory, the majority of

employees present at the meetings completed the survey, which limited self-selection bias. Surveys were collected by the researcher and de-identified to maintain anonymity.

Participants were asked to indicate where they were in their roster cycles. The majority were at work or “rostered on” (76 per cent), fewer weren’t at work or “rostered off” (20 per cent), and small proportions were in transit to work (2 per cent) and from work (2 per cent), respectively. Since the DASS-21 questions related to mental health symptoms experienced the previous week, responses were anticipated to vary, depending on whether participants were at work or at home. However, this couldn’t be verified due to the small proportion that completed the survey during rostered-off and transit times.

5.5 Measures

An objective of this study was to develop a valid and reliable survey instrument for measuring the factors of adjustment, psychological distress, stigma and help-seeking intention. Instead of using an often-critiqued, idiosyncratic, self-developed measure (e.g., Rickwood & Thomas, 2012), existing and validated instruments were selected. An extensive review of the literature was conducted to select the most appropriate measures for the four constructs encompassed by the model. Job demands were clarified by reviewing prior FIFO psychological health research. The measures for the survey instrument are displayed in Table 5.3 below, and additional information on the quantitative and qualitative questions are provided in the following sub-section.

Table 5.3 *Measures for the Survey Instruments*

Name of scale	Author and year	No of items	What it measures
Adapted Adjustment Scale.	Behr (2012) adapted the Cultural Adjustment Scale from Black (1988) and Black and Stephens (1989) to suit the FIFO employee population in WA.	8 items	A tripartite model of work, social and general adjustment.
Depression, Anxiety, Stress Scale (DASS-21).	Lovibond and Lovibond (1995)	21 items	A tripartite model of depression, anxiety and stress. Three scales measure symptoms of depression (anhedonia, low positive affectivity), anxiety (physiological hyper-arousal) and stress (negative affectivity).
General Help-Seeking Questionnaire (GHSQ) used on two levels: Condition 1: emotional problems, Condition 2: suicidal thoughts.	Wilson et al. (2005)	10 items per condition = 20 items	Help source (formal/informal), intention to access support.
Perceptions of Stigmatisation by Others for Seeking Psychological Help (PSOSH).	Vogel et al. (2009)	5 items	Perceptions of stigma for seeking treatment associated with psychological distress.

5.5.1 Adapted Adjustment Scale

The Adapted Adjustment Scale (AAS) ([Behr, 2012](#)) was a modification of the Cultural Adjustment Scale for reflecting antecedent factors of adjustment, as indicated in prior FIFO

employee research. [Black and Stephens \(1989\)](#) instrument comprised 14 items assessing three factors of cultural adjustment. The three factors included: (a) social adjustment (relational interactions with the host community comprising four items); (b) work adjustment (responsibilities and performance comprising three items); and (c) general adjustment (life conditions such as food and accommodation comprising seven items).

Behr's (2012) adapted scale consisted of eight questions relating to three factors: (a) social adjustment (comprising three items); (b) work adjustment (comprising three items); and (c) general adjustment (comprising two items). Each item used a six-point Likert response scale ranging from "not at all" to "completely", consistent with the original scale where higher scores indicated higher adjustment. The questions in the AAS included the level of adjustment to shared living conditions, time away from loved ones and socialising within the masculine culture. Behr based these questions on the findings of FIFO employee studies conducted by ([Carter & Kaczmarek, 2009](#)), [Pirotta \(2009\)](#), [Beach et al. \(2003\)](#) and [Taylor and Simmonds \(2009\)](#). Behr ran a confirmatory factor analysis on the AAS and confirmed the validity of the findings and ability to distinguish between the three factors. These results inspired the confidence to use the scale as an effective measure of the cultural adjustment of FIFO employees in the current study.

5.5.2 Depression, Anxiety, Stress Scale (DASS-21)

The Depression Anxiety Stress Scale ([DASS-21; Lovibond & Lovibond, 1995](#)) has demonstrated good construct validity and excellent reliability in large clinical and non-clinical samples ([Henry & Crawford, 2005](#); [Lovibond & Lovibond, 1995](#)). In previous FIFO mining employee psychological health studies, both [Bowers et al. \(2018\)](#) and [Henry et al. \(2013\)](#) used the K-10, a general measure of psychological distress. While their studies are useful for indicating prevalence, they do not specify the mental disorders present among the participants, important information for developing effective prevention and early intervention strategies. Only three previous studies used the DASS for FIFO employee research. The DASS-21 has been well utilised in international health research on the general population ([Henry & Crawford, 2005](#); [Migliorini, New, & Tonge, 2009](#)) and was therefore selected to measure depression, anxiety and stress symptoms in this study.

The self-report tool was designed to measure the core symptoms of depression, anxiety and stress during the previous seven days. The 21 questions comprised three seven-item scales, scored on a four-point (0 - 3 response range) Likert scale, with higher symptoms reflecting higher scores. The measure was a short form of the original 42-item questionnaire (DASS-42), therefore the

DASS-21 score was multiplied by two. Scores were categorised according to official benchmarks and used validated clinical cut-off categories, viz., Normal, Mild, Moderate, Severe and Extremely Severe. The cut-off scores for the depression subscale were: Normal 0 - 9, Mild 10 - 13, Moderate 14 - 20, Severe 21 - 27, Extremely Severe >28. Cut-off scores for the anxiety subscale were: Normal 0 - 7, Mild 8 - 9, Moderate 10 - 14, Severe 15 - 19, Extremely Severe >20. Cut-off scores for the stress subscale were: Normal 0 - 14, Mild 15 - 18, Moderate 19 - 25, Severe 26 - 33, Extremely Severe >34. Scores in the moderate and higher ranges indicated a likelihood that the individual would receive a clinical diagnosis, also referred to as “having a condition” ([Henry & Crawford, 2005](#); [Lovibond & Lovibond, 1995](#)).

5.5.3 General Help-seeking Questionnaire (GHSQ)

The General Help-Seeking Questionnaire (GHSQ) ([Wilson et al., 2005](#)) was developed concurrently with Rickwood et al.’s (2005) process theory of help-seeking to assess future help-seeking behavioural intentions from different sources and for different problems. The GHSQ demonstrated satisfactory reliability and validity for both emotional problems and suicidal thoughts ([Rickwood et al., 2005](#); [Wilson et al., 2005](#)). Since the GHSQ is consistent with help-seeking theory and allows for the assessment of help-seeking intentions in a range of contexts, it was considered the most appropriate measure for this study. A ten-item instrument, the General Help-Seeking Questionnaire (GSHQ) ([Wilson et al., 2005](#)) was used to evaluate the help-seeking intentions of participants for their preferred informal (e.g., friend) or formal (e.g., doctor) sources of support. The measure has been used internationally for evaluating help-seeking for mental health problems and suicide risk ([Smith, Tran, & Thompson, 2008](#)), as well as assessing the effectiveness of intervention programs ([Wilson & Deane, 2010a](#)). The “help sources” options in the survey were: intimate partner, friend, parent, other relative/family member, mental health professional (e.g., psychologist, social worker, counsellor), telephone help-line (e.g., Lifeline), doctor/GP, minister or religious leader (e.g., priest, rabbi, chaplain), “would not seek help from anyone” and “other”, with space to answer who that was. It was not specified whether the help-line was anonymous, although the majority of WA help-lines do not require callers to identify themselves. The items were measured on a 10-point Likert scale, with 1 to 7 indicating “very unlikely” to “very likely”, and higher scores signalling a higher intention to access support and inverse association with negative beliefs about seeking professional help for mental health problems ([Wilson et al., 2005](#)). The GHSQ was administered under two conditions: emotional problems and suicidal thoughts.

5.5.4 Perceptions of Stigma from Others for Seeking Help (PSOSH)

A five-item instrument, Perceptions of Stigmatisation by Others for Seeking Help (PSOSH) ([Vogel et al., 2009](#)), evaluated participants' perceptions of stigma associated with treatment seeking. The PSOSH has been widely used in exploratory psychology and therapeutic research and demonstrated good reliability and internal validity ([Owen, Thomas, & Rodolfa, 2013](#)). The following prompt was used: "To what degree do you believe that the people you interact with would see you as...?" Stigmatised perceptions were categorised as "react negatively to you", "think bad things of you", "see you as seriously disturbed", "think of you in a less favourable way" and "think you posed a risk to others". The items were measured on a five-point Likert scale, with one correlating to "not at all" and five correlating to "a great deal" and higher scores indicating higher levels of perceived stigma.

5.6 Data Analysis

The research questions examined: (a) the extent of depression, anxiety and stress symptoms; (b) how adjustment, mental health, stigma and help-seeking were related; and (c) the influence of job demands on those relationships. To provide answers to these questions, a large data sample was needed to deliver an adequate effect size for symptom prevalence and relationships between the variables. The accepted threshold of number of cases per variable in SEM is well established in the literature ([Hair, Ringle, & Sarstedt, 2011](#); [Preacher et al., 2010](#)), so obtaining a large data sample (>250) for this study with minimum cases per variable, followed the recommendations for reducing method bias ([Podsakoff et al., 2003](#); [Podsakoff, MacKenzie, & Podsakoff, 2012](#)) and strong statistical analysis ([Hair et al., 2011](#); [Suhr, 2006](#)).

5.6.1 Approach

The study used a quantitative analysis and correlational research design that were assessed by SEM. Self-reported levels of adjustment, psychological distress, stigma and help-seeking were gauged by valid instruments. The influence of job demands on the relationships between these processes was also examined through SEM ([Byrne, 2013](#); [Hair et al., 2011](#)).

5.6.2 Structural Equation Modelling (SEM)

SEM is a flexible and comprehensive methodology and an increasingly popular method for examining causal relationships in a strong research design. This includes testing hypotheses and determining whether a structural theory can explain specific effects ([Byrne, 2013](#); [Lowry & Gaskin, 2014](#)). SEM has increasingly been used and recognised as an appropriate method for examining a range of research data in the fields of management, health and psychology ([for example, see Gomes, Faria, & Gonçalves, 2013](#)). A number of important and useful aspects of SEM offer advantages over traditional approaches (for example, multiple regression analysis); while traditional methods require a default model, SEM requires specification for estimating and testing a model ([Lowry & Gaskin, 2014](#); [Preacher et al., 2010](#)). [Suhr \(2006\)](#) observed that SEM does not force a default model and has fewer limitations than traditional methods when it comes to the types of relationships that can be specified. Importantly, [Suhr \(2006\)](#) also proposed that using SEM model specification requires a theoretical approach rather than just observing patterns in the data and making theoretically ungrounded suppositions.

From a theoretical perspective, SEM has a further advantage in that it explicitly specifies error, while traditional methods statistically assume that measurement occurs without error ([Byrne, 2013](#)), solidifying SEM as a more accurate measure ([Hair et al., 2011](#); [Suhr, 2006](#)). Traditional methods offer simple significance tests to establish relationships between variables, group differences and the percentage of explained variance, while SEM is a multivariate technique that includes observed (measured constructs) and unobserved (latent constructs) variables, unlike traditional techniques that assess only measured variables ([Lowry & Gaskin, 2014](#); [Suhr, 2006](#)). SEM does not provide any straightforward tests to determine model fit. Rather, evaluating model fit requires a series of multiple tests, as outlined in the following Analysis of Structural Models section. Another major benefit of SEM is that the technique resolves problems of multi-collinearity due to the requirement for multiple measures to designate a latent construct, meaning that multi-collinearity cannot occur as the unobserved variables signify the latent constructs ([Lowry & Gaskin, 2014](#); [Suhr, 2006](#)). Causal processes are presented by a series of structural (i.e. regression) equations.

Consistent with [Byrne \(2013\)](#), specifying the model for this study involved formulating hypothesised relationships between the variables. The set of equations was then solved simultaneously to test model fit and estimate parameters. The pictorial diagrams of the structural relationships allowed for conceptualising the relationships being investigated, rather than reading lines of equations.

The hypothesised model was statistically examined using a large number of variables concurrently, including controls, to determine the extent to which the theory was consistent with the data and parameter estimates ([Bagozzi & Yi, 2012](#); [Gomes et al., 2013](#)). The model was assessed for goodness of fit statistics and support for the credibility of the hypothesised relationships between the variables – relationships with poor model fit were rejected. SEM has been criticised for its use in poorly justified prescriptive statements in cross-sectional research ([Martin, 2011](#)), so inferences should be made with care. While regression analysis could be used to assess the relationships examined in this thesis, it could not be performed concurrently or include error terms, so for these reasons, SEM was selected as the most appropriate method for testing the complex models hypothesised in this study.

5.6.3 Rationale

Since the research questions posed in this thesis investigated subjective experiences, self-reporting measures were selected as the most appropriate way of capturing data. Limitations of self-reporting include vulnerability to common-method bias and not assuming causal inferences, both frequent complaints in behavioural science research using surveys (e.g., [Podsakoff et al., 2003](#); [Podsakoff et al., 2012](#)). A number of research challenges have been recognised in the interface between work and psychology ([Luthans, Avolio, et al., 2007](#)), particularly measurement issues [Podsakoff et al. \(2003\)](#) and others caused by response bias (e.g., social desirability, leniency biases), the context in which measures are obtained and difficulties for participants to reflect and report on their past perceptions. These issues emphasised the importance of using sensible statistical controls ([Podsakoff et al., 2003](#); [Podsakoff et al., 2012](#)), including precautions such as:

- Ensuring respondent anonymity;
- Improving scale items;
- Using partial correlation procedures designed to control for method bias; and
- Controlling for the effects of a directly measured latent factor.

In general, Occupational Health Psychology research can be improved by incorporating a variety of measures (e.g., both self-reporting and other measures), using a comprehensive approach and controlling for confounding variables ([Podsakoff et al., 2003](#); [Podsakoff et al., 2012](#)). Coupled with a sizeable representative sample, the methodological design selected for this study provided confidence in the findings that informed our understanding of the relationships between adjustment, mental health, stigma, help-seeking and job demands.

The survey data were analysed in two parts as recommended by [Anderson and Gerbing \(1988\)](#), and discussed in the following section. The two-step process is regularly used in behavioural science studies ([for example, see Martin & Giallo, 2015](#)) and involves analysing both measurement and structural models. Step one assesses the measurement models with the purpose of determining the instrument's suitability to measure the concepts of interest. This process incorporates Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA) and One-Factor Congeneric Models (OCM). Step two is an exploration of the structural models to understand the relationships between the latent constructs.

To indicate the covariates (dependent variables) of the model, Pearson correlations (r) between the variables, means (M) and standard deviations (SD) are depicted in Table 5.4.

Table 5.4 *Model Covariates*

Covariate Variables		<i>M</i> (<i>SD</i>)	1	2	3	4	5	6	7
Psychological Wellbeing	Composite	.68 (.58)							
	Depression	.72 (.70)	.924**						
	Anxiety	.46 (.53)	.872**	.693**					
	Stress	.85 (.67)	.872**	.802**	.748**				
Stigma Perception	Stigma	1.9 (.96)	.489**	.462**	.429**	.445**			
Help-seeking Intentions	Composite	3.31 (1.13)	-.189**	-.214**	-.127**	-.165**	-.259**		
	Informal	4.22 (1.5)	-.222**	-.248**	-.144**	-.202**	-.247**	.865**	
	Formal	2.41 (1.22)	-.078 (.067)	-.092	-.059 (.163)	-.058 (.169)	-.176**	.790**	.375**

5.6.4 Analysis of Measurement Models

Analysis of the measurement models involved assessing the instruments used in the survey. Three out of the four instruments were already well established in the literature, so the measurement model analysis was largely confirmatory rather than exploratory. The items for all four measures were presented in a Likert-scale format and defined as order-categorical or ordinal measurement data.

Cronbach's alpha coefficient was used to evaluate the measure's internal consistency and reliability. One-factor Congeneric Models (OCM) were specified for each measure, following the procedures outlined by [Byrne \(2013\)](#). A measurement set is defined as congeneric when the items in the set measure the same construct ([Jöreskog, 1971](#)). This analysis was performed for all four instruments, being the AAS (two to three items for each of three scales), the DASS-21 (seven items for each of three scales), the GHSQ (ten items for every two scales) and the PSOSH (five items with one scale). The Cronbach alpha coefficient (α), a common approach for Likert-type scales, displayed values ranging between 0 and 1 –

closer to 1 indicating greater internal consistency ([Cronbach, 1951](#); [Gliem & Gliem, 2003](#)).

Internal consistency α criteria were ([George & Mallery, 2003, p. 231](#)):

- $\alpha > .9$ = excellent,
- $\alpha > .8$ = good,
- $\alpha > .7$ = acceptable,
- $\alpha > .6$ = questionable,
- $\alpha > .5$ = poor, and
- $\alpha < .5$ = unacceptable.

These criteria were employed in the study to assess the internal consistency of each measure. Exploratory Factor Analysis (EFA) was conducted on the AAS, while Confirmatory Factor Analysis (CFA) was conducted on the DASS-21, GHSQ and PSOSH. With the exception of the AAS, the other instruments were already well established, so the items on each scale were deemed to be good indicators of the latent constructs they were aimed at assessing. The purpose of the EFA and CFA was to clarify the appropriateness of these measures for the FIFO workforce.

5.6.5 Analysis of Structural Models

The research used SEM to assess the structural models, with maximum likelihood (ML) estimation accounting for measurement error when estimating relationships between the latent variables. ML has a proven capacity for robustness with regard to departures from normality ([Bagozzi & Yi, 2012](#); [Byrne, 2013](#)) and can even be applied to small sample sizes, provided the measure's distribution is not too far out of range ([Bagozzi & Yi](#)). ML was therefore selected as the most appropriate estimation for this study.

In the absence of a single standard or statistic for evaluating model fit, studies have relied on a combination of indices ([Bagozzi & Yi, 2012](#); [Hu & Bentler, 1999](#)). Of highest importance are the Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Tucker Lewis Index (Non-Normed Fit Index) TLI(NNFI) and Standardized Root Mean Square Residual (SRMR) ([Hu & Bentler, 1999](#)). [Bagozzi and Yi \(2012\)](#) confined the CFI and TLI(NNFI) indices to a range of 0.00 to 1.00 inclusive, although (rarely) very good model fits may exceed 1.00. Some indices penalise for model complexity and reward model parsimony, for example, the CFI often fits complex models better than parsimonious models, while the TLI(NNFI) and RMSEA are inclined to reward for parsimony and penalise for complexity (Lowry & Gaskin, 2014; Suhr, 2006). The CFI and RMSEA are relatively independent of sample size; not so for the SRMR and NNFI ([Marsh, Balla, & McDonald, 1988 1988](#)). Bagozzi and Yi concluded that no single index meets all these criteria, but described together, these four provide the best criteria for evaluating models satisfactorily.

The p of Close Fit (PCLOSE) statistic has also been reported. Used concurrently with the RMSEA, PCLOSE provides information on how closely the model fits ([Kenny, Kaniskan, & McCoach, 2015 2015](#)). A RMSEA greater than .05 and a p less than .05 indicates poor fit, and conversely, a RMSEA greater than .05 and p less than .05 indicates good fit. Significance tests are affected by sample size and the degrees of freedom (df), with lower df relating to lower power in the PCLOSE statistic ([Bagozzi & Yi, 2012](#); [Hu & Bentler, 1999](#)). The chi-square (χ^2) test statistic is also commonly reported, although the χ^2 is highly sensitive to sample size, with larger samples trending towards significance and requiring interpretation alongside other indicators of model fit ([Bagozzi & Yi, 2012](#); [Byrne, 2013](#)). Rather than solely referring to significance, [Marsh et al. \(1988\)](#) recommended applying the χ^2 ratio to the degrees of freedom (df). Based on the above goodness of fit indices, the criteria values used to assess model fit in this study were as follows ([Bagozzi & Yi, 2012](#); [Trépanier, Fernet, & Austin, 2015](#)):

RMSEA < .08 = acceptable fit, and < .05 = excellent fit;
CFI > .90 = acceptable fit, and > .95 = excellent fit;
TLI(NNFI) > .90 = acceptable fit, and > .95 = excellent fit;
SRMR < .05;
PCLOSE statistic > .05; and
 χ^2/df ratio < 3.0 = acceptable fit, and < 2.0 = reasonable fit.

5.6.6 Mediation Analysis

Following the procedures of [Gaskin \(2016a\)](#), mediation was analysed for the composite variables using the software statistics Indirect Effects Estimand plugin ([Gaskin, 2016b](#)). Bootstrapping is a resampling technique that uses a method (other than confidence intervals) to estimate a population parameter. This is useful, because reusing the same sample data repeatedly improves the estimate of a population statistic. In this sample, bootstrapping was performed with 2000 bootstrap samples (rather than the standard 200) to improve the accuracy of the analysis ([Gaskin, 2015](#)). Bias-corrected confidence intervals, at the 95% confidence level, were used to correct for any artificially inflated estimates caused by the bootstrapping technique ([Hayes, 2012](#); [Lowry & Gaskin, 2014](#)). All the indirect effects had confidence intervals of 95%, corresponding to one-tailed alpha .05 hypothesis tests, as recommended for mediation research by [Preacher et al. \(2010\)](#). Accordingly, contrast confidence intervals (CIs) were set at 90% to correspond with two-tailed hypothesis tests. The mediation analysis followed the recommendations of [Preacher, Rucker, and Hayes \(2007\)](#) and [Preacher and Hayes \(2004\)](#), including squared multiple correlation analysis (r) to arrive at a percentage for the variance explained by each variable.

5.6.7 Moderated Mediation Analysis

Job demands have been shown to moderate the mediating effects between cognitive-affective-behavioural processes (e.g., [Ng, Ang, & Chan, 2008](#)). In the current research, it was hypothesised that stigma would mediate the effects of psychological wellbeing on help-seeking intentions due to stigma being an attitudinal barrier. Further, because job demands have been shown to have a moderating effect, it was also hypothesised that job demands would have an effect on the relationships between stigma, psychological wellbeing and help-seeking intentions. This used the TPB as a theoretical framework and built on ([Britt et al., 2008](#))-research (mentioned in Chapter 3). Subsequently, SEM was used to explore the extent to which such moderated mediation

occurred in the structural model. Moderation is used for testing whether the effects of a model remain consistent across environments and groups ([Lowry & Gaskin, 2014](#)).

First, a moderated mediation analysis between adjustment, psychological distress, stigma and help-seeking investigated whether help-seeking differed between genders. Second, analysis sought to determine how and why these concepts were related to the job demands of the participants. Group size inequality may have inflated significant findings in groups with larger participant numbers, although the effect of multiple group analysis is not particularly problematic when groups are representative of the population of interest. Where this is not the case, inference errors can occur ([Arbuckle, 2007](#); [Byrne, 2013](#)). One of the advantages of SEM analysis is its robustness in dealing with unequal group sizes ([Hair et al., 2011](#); [Lowry & Gaskin, 2014](#)), and in addition to the sample's representativeness of the population of interest, multi-group analysis was deemed appropriate for this study.

Analysis of gender and job demands followed the recommendations in the psychological distress, stigma and linked help-seeking literature (for example, [Britt et al., 2008](#); [Vogel & Wade, 2009](#)). Job demands of interest highlighted in previous FIFO psychological health research were used to gain a better understanding of the effects on this population ([Henry et al., 2013](#); [Peetz et al., 2012](#)). Moderated mediation analysis was performed on multi-level groups, following the recommendations of [Preacher et al. \(2007\)](#), and used a bootstrap technique to investigate pathway (beta value) differences between direct and indirect standardised effects, with and without the moderator variables. Employment conditions selected for the moderated mediation analysis were selected for being both theoretically valid (for example, likely to induce strain in previous PSC and FIFO employee studies) and statistically significant in the sample. The employment conditions used for analysis were roster compression and the number of hours worked per day. Table 5.5 below summarises the analytical approach used to examine the research hypotheses.

5.7 Conclusion

This chapter has outlined the methodology and justified why the chosen methods and data analysis techniques were selected for the study. The research design was quantitative in nature and utilised SEM as the main method of analysis. Participants (N = 629) were employees working under FIFO arrangements in various locations around Western Australia. They responded to a survey that was delivered in both online and hard copy formats over a six-month period; the responses were therefore a reflection of trends in the sector during the six-month data-collection phase. The survey comprised a number of items from established scales used in previous, validated

research on the mental health dimensions of adjustment, depression, anxiety, stress, stigma and help-seeking. The items were selected to capture FIFO mining employee working conditions and individuals' demographic information.

Potential limitations of the research include its cross-sectional design, the nature of which has attracted concerns, such as reverse causality. Further, the study was conducted in only one country, and a comparative design, drawing on data from another country may have strengthened the findings and generalisability. However, due to the scope and timeframe allowed for the thesis, it was not possible to extend the scope of the study. A longitudinal study would have been preferred, but was considered unviable due to high rates of turnover and the mobile nature of the FIFO mining workforce. Due to confidentiality concerns of participating organisations, a multi-source data design was ruled out. The following chapter presents the results of the study.

Table 5.5 *Summary of Hypotheses*

Objectives	Hypothesis	Analysis technique	Location in thesis
Relates to RQ 1: 'To what extent are self-reported symptoms of depression, anxiety and stress experienced by FIFO mining employees and how do these rates vary under different working conditions?' Seeks to establish prevalence rates of mental health problems among a good sized sample.	Hypothesis 1a: Depression, anxiety and stress symptoms are higher among employees on high compression rosters compared with those on lower compression rosters. Hypothesis 1b: Depression, anxiety and stress symptoms are higher among employees who work longer days compared with those working shorter days.	Assesses how symptom prevalence relates to employment conditions and individual differences, using Spearman's rank-order correlation (for ordinal data) and the Mann-Whitney or Kruskal-Wallis tests (for categorical data) to assess the associations.	Chapter 6, section 6.4.
Relates to RQ 2: 'In what ways are adjustment, psychological wellbeing, stigma and help-seeking among FIFO employees related?' The conceptual model hypothesises that adjustment negatively relates to psychological distress and that psychological distress and stigma negatively relate to help-seeking.	Hypothesis 2: Adjustment levels are higher among employees with lower depression, anxiety and stress symptoms compared to those with lower levels of adjustment.	SEM is used first to model the data in accordance with the hypothesised relationships, and then to assess mediation effects.	Chapter 7, section 7.4.
Relates to RQ 2.	Hypothesis 3: Levels of help-seeking intentions for emotional problems will be higher among FIFO employees with lower levels of depression, anxiety and stress symptoms when compared with suicidal thoughts.	SEM.	Chapter 7, section 7.4.

Objectives	Hypothesis	Analysis technique	Location in thesis
Relates to RQ 2.	Hypothesis 4a: The preference for informal help-seeking will be higher among males compared to females. Hypothesis 4b: The preference for formal help-seeking will be higher among females compared to males.	SEM.	Chapter 7, section 7.4.
Relates to RQ 2.	Hypothesis 5: Higher levels of stigma will be perceived among FIFO employees with higher levels of depression, anxiety and stress symptoms compared to those with lower symptoms.	Squared multiple correlations analysis.	Chapter 7, section 7.5.
Relates to RQ 2.	Hypothesis 6: Higher perceptions of stigma will mediate the negative effect of psychological distress and help-seeking.	SEM.	Chapter 7, section 7.5.
Relates to RQ 3: 'What is the influence of job demands on the relationships between adjustment, psychological wellbeing, stigma and help-seeking among FIFO employees?' The conceptual model hypothesises that job demands moderate the relationships between internal processes.	Hypothesis 7: Higher roster compression (Hypothesis 7a) and longer working hours a day (Hypothesis 7b) will strengthen the negative effect of stigma on psychological distress and help-seeking.	Uses SEM moderated multi-group mediation analysis to examine whether the hypothesised mediation effects of stigma on the relationship between psychological distress and help-seeking is moderated by job demands.	Chapter 7, section 7.6.

Chapter 6 - Results

6.1 Introduction

The previous chapter described the overarching research methodology and data analysis and provided justification for their use in this study. This chapter presents the research findings, commencing with the descriptive statistics that assisted answering the first research question: “To what extent are symptoms of depression, anxiety and stress experienced by FIFO employees self-reported?” The next section analyses the measurement models. Step one of the two-step process outlined in Anderson and Gerbing (1988) assessed the measurement models for their suitability to the instruments for gauging the underlying concepts of interest. This entailed Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA) and One-Factor Congeneric Models (OCM). The process has been widely used in previous studies (for example, [Harms, 2010](#); [Martin & Giallo, 2015](#)), particularly in the behavioural sciences. Depictions of the OCMs have been provided to assist with conceptualising the assessment. The first part of step one concludes with an evaluation of construct validity and reliability.

The second step of the two-step approach ([Anderson & Gerbing, 1988](#)) assessed the suitability of the structural models, an important analysis because the results determined the merit of the proposed conceptual model. Next, the chapter examines the structural models to answer the second research question: “In what ways are adjustments, psychological distress, stigma and help-seeking among FIFO employees related?” Thereafter mediation analysis determined how and why these variables were related. After assessing the hypothesised relationships, moderated multi-group mediation analysis was performed to answer the third and final research question: “What is the influence of job demands on the relationships between adjustment, psychological distress, stigma and help-seeking among FIFO employees?” The chapter concludes with a comparison of the conceptual model and the tested empirical model.

To indicate the covariates (dependent variables) of the model, Pearson correlations (r) between the variables, means (M) and standard deviations (SD) are depicted in Table 6.1.

Table 6.1 *Covariates*

Covariate Variables		<i>M</i> (<i>SD</i>)	1	2	3	4	5	6	7
Psychological Wellbeing	Composite	.68 (.58)							
	Depression	.72 (.70)	.924**						
	Anxiety	.46 (.53)	.872**	.693**					
	Stress	.85 (.67)	.872**	.802**	.748**				
Stigma Perception	Stigma	1.9 (.96)	.489**	.462**	.429**	.445**			
Help-seeking Intentions	Composite	3.31 (1.13)	-.189**	-.214**	-.127**	-.165**	-.259**		
	Informal	4.22 (1.5)	-.222**	-.248**	-.144**	-.202**	-.247**	.865**	
	Formal	2.41 (1.22)	-.078 (.067)	-.092	-.059 (.163)	-.058 (.169)	-.176**	.790**	.375**

6.2 Help-Seeking Differences

Means (M) and standard deviations (SD) for the measures of adjustment, psychological distress, stigma and help-seeking are set out in Table 6.1 while Table 6.2 shows differences in male and female help-seeking, by applying the Mann-Whitney test to the GHSQ scores.

Table 6.2 *Descriptive Statistics and Group Comparisons (Mann-Whitney Test) for Help-Seeking Differences between Genders*

Help source	Gender	Emotional problems			Suicidal thoughts		
		5% CI	Sig. (p value)	ts	95% CI	Sig. (p value)	ts
Intimate	Male	3.23-	.014*	25,664.000	4.87-5.67	.278	23,750.500
	Female	2.97-			4.29-6.14		
Friend	Male	2.92-	.000**	28,662.000	4.15-4.83	.005**	26,248.500
	Female	2.46-			4.15-5.86		
Parent	Male	4.06-	.004**	26,266.000	4.73-5.44	.396	23,418.000
	Female	3.73-			4.83-6.34		
Relative	Male	3.28-	.110	24,498.000	3.86-4.56	.947	22,129.500
	Female	4.22-			4.67-6.38		
Mental	Male	2.99-	.569	23,027.000	4.32-4.96	.050**	25,007.500
	Female	2.63-			4.01-5.54		
Help-line	Male	1.79-	.120	20,122.500	3.78-4.49	.270	
	Female	1.40-			4.39-5.96		
Doctor	Male	3.05-	.338	23,574.000	4.01-4.67	.001**	
	Female	2.81-			4.54-5.97		23,421.500
Religious	Male	0.94-	.104	20,441.500	1.70-2.51	.913	22,094.500
	Female	.353-			1.53-3.99		
No-one	Male	3.54-	.008**	18,518.500	3.65-4.50	.048*	19,517.500
	Female	2.16-			2.33-4.36		
Other	Male	2.87-	.852	22,466.000	2.56-3.49	.797	22,547.500
	Female	2.69-			2.23-4.43		

CI = Confidence Interval; ts = Test Statistic; Sig = Approximate significance; p<.05*; p<.01**.

The results of this FIFO sample showed no statistically significant differences between men and women for emotional problems or suicidal thoughts in relation to help sources of a relative, helpline or religious leader. Help-seeking intentions for emotional problems were statistically significant for an intimate partner, friend and parent, and there was a strong statistical

trend of not seeking help from anyone. Help-seeking intentions for suicidal thoughts were found to be statistically significant for a friend, mental health professional and a doctor. As observed in help-seeking for emotional problems, a statistical trend of not seeking help from anyone was also evident for suicidal thoughts, although this was stronger for emotional problems than suicidal thoughts.

To explore whether help-seeking varied by different concerns/problem types, pairwise comparison was conducted to determine the mean for “help sources”. The means (M), standard deviations (SD) and pairwise comparisons (t) displayed in Table 6.3 indicate the differences in help-seeking preferences between “emotional problems” and “suicidal thoughts”. Notably, the results show significant differences among the sample for help-seeking preferences, depending on the type of problem experienced.

Table 6.3 *Descriptive Statistics of GHSQ Items and Pairwise Comparisons (t)*

Help source	Emotional problems M (SD)	Suicidal thoughts M (SD)	t
Intimate partner	5.16 (1.9)	4.59 (2.3)	7.70**
Friend	4.38 (1.8)	4.07 (2.1)	3.97**
Parent	3.86 (2.1)	3.43 (2.3)	5.56**
Relative	3.48 (1.9)	3.29 (2.1)	2.42*
Mental health professional	2.96 (1.8)	3.76 (2.2)	-9.71**
Help-line	2.16 (1.4)	3.07 (2.1)	-12.51**
Doctor	3.03 (1.8)	3.44 (2.1)	-5.66**
Religious leader	1.50 (1.1)	1.8 (1.5)	-6.69**
No-one	3.01 (1.9)	2.75 (1.9)	3.19**
Other	2.33 (1.8)	2.16 (1.8)	2.73**

**p < 0.01; *p < 0.05; df = 559

6.3 Symptom Prevalence

6.3.1 Depression, Anxiety and Stress Symptoms

Answering the first research question required an assessment of symptom prevalence and understanding of how this related to employment conditions and individual differences. In this

study, Spearman's rank-order correlation (for ordinal data) and Mann-Whitney test (for categorical data) were used to examine these associations. The continuous DASS-21 scores were used for the analysis.

The mean scores of the sample were 9.40 for depression, 5.77 for anxiety, and 11.10 for stress. Although mean scores are useful for indicating score trends, they do not assist in interpreting individual results. Since the DASS scores were skewed by the nature of the instrument, reference to mean scores are largely redundant ([Henry & Crawford, 2005](#)). The descriptive analysis determined that 63.7 per cent of participants' overall scores fell in the normal or mild categories (no condition) and 36.3 per cent fell in the moderate, severe or extremely severe categories (one or more conditions). This is compared to a rates within the general Australian population, where the DASS-21 categories of Normal and Mild account for 87% of the comparative general population sample, while Moderate, Severe and Extremely Severe account for 13% (Lovibond & Lovibond, 1995). The results showed that participants experienced one (14.8 per cent), a combination of two (9.2 per cent), or a combination of three (12.3 per cent) conditions. The scores did not vary significantly by gender with 35 per cent of men and 42 per cent of women reported experiencing one or more conditions. The findings revealed that participants experienced one (14.8 per cent), a combination of two (9.2 per cent) or all three (12.3 per cent) aspects of depression, anxiety and stress. Overall, the scores fell into the moderate, severe or extremely severe categories as follows: depression was 28.3 per cent, anxiety was 22.3 per cent, and stress was 19.4 per cent. These scores compared with the general Australian population are depicted in Figure 6.1 and detailed in Table 6.4.

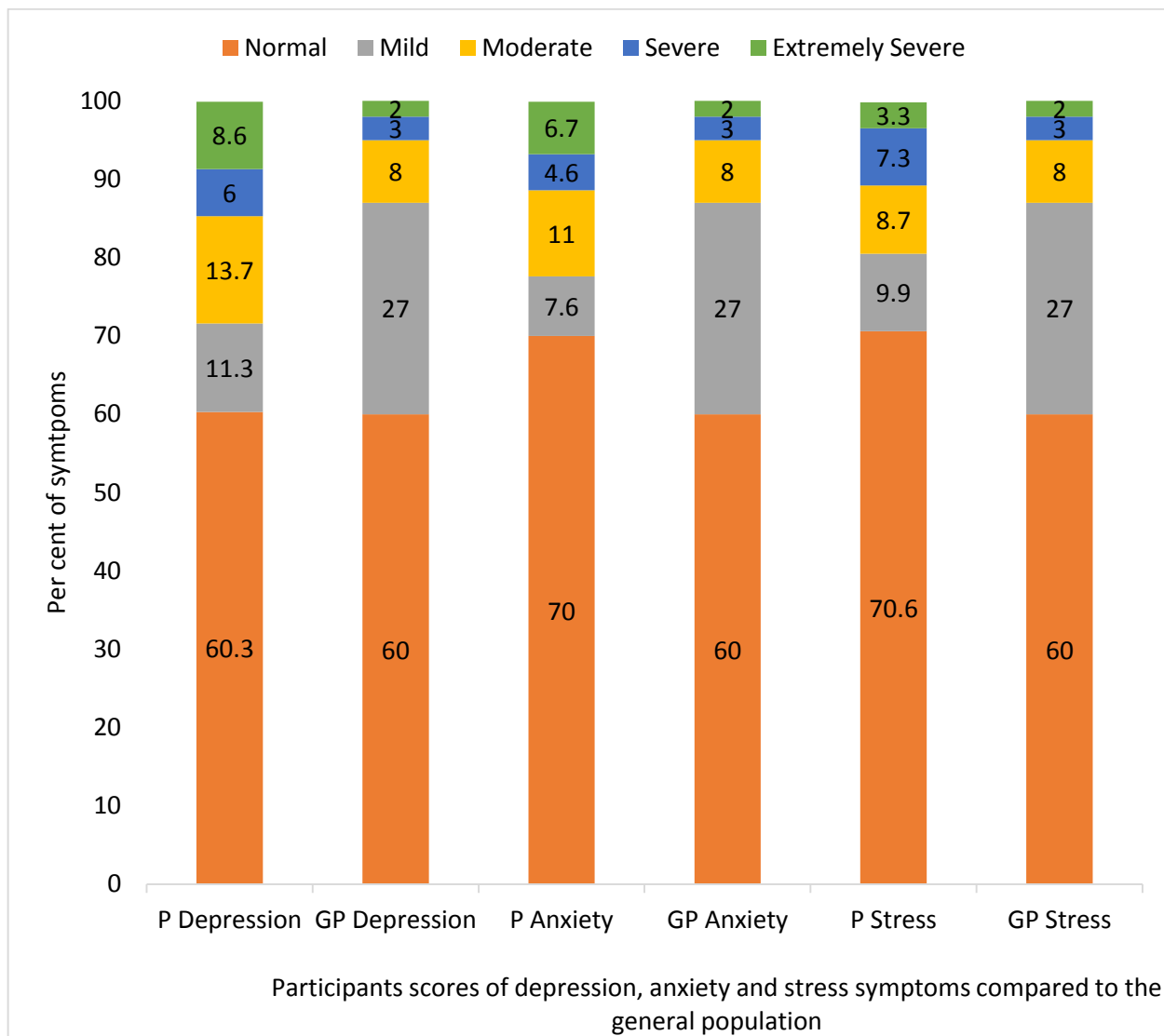


Figure 6.1 Participants' Depression, Anxiety and Stress Scores (Figure adapted from Vojnovic & Bahn, 2015)

Table 6.4 *Depression, Anxiety and Stress Scores*

Category	Condition		No Condition N	One Condition N	Two Conditions N	Three Conditions N	N (628)
	Score range	M (SD) %					
Depression							
		9.40 (9.92)					
Ex-Severe	>28	8.6	0	3	6	45	54
Severe	21-27	6.0	0	7	13	18	38
Moderate	14-20	13.7	0	43	29	14	86
Mild	10-13	11.3	41	24	6	0	71
Normal	0-9	60.3	359	16	4	0	379
Anxiety							
		5.77 (7.09)					
Ex-Severe	>20	6.7	0	1	3	38	42
Severe	15-19	4.6	0	2	8	19	29
Moderate	10-14	11.0	0	24	25	20	69
Mild	8-9	7.6	24	17	7	0	48
Normal	0-7	70.0	376	49	15	0	440
Stress							
		11.10 (9.59)					
Ex-Severe	>34	3.3	0	0	3	18	21
Severe	26-33	7.3	0	3	8	35	46
Moderate	19-25	8.7	0	10	21	24	55
Mild	15-18	9.9	17	31	14	0	62
Normal	0-14	70.6	383	49	12	0	444
Male			338	79	43	61	521
Female			62	14	15	16	107
Total			400	93	58	77	

ExSevere = Extremely Severe; (Table originally published in Vojnovic & Bahn, 2015)

After analysing the prevalence of depression, anxiety and stress scores for the sample, individual differences were also examined. Analysis of the continuous DASS 21 scores entailed a Spearman's rank-order correlation (for ordinal data), the Mann-Whitney test for the variables with two groups and the Kruskal-Wallis test (categorical data) for variables with three or more groups. The results showed no statistically significant differences for gender, education or living arrangements. Depression, anxiety and stress symptoms were higher among younger FIFO workers, with very weak negative Spearman rank-order correlations between age and depression ($r_s = -.084$), anxiety ($r_s = -.098$) and stress ($r_s = -.081$) ($n = 628$, $p < 0.05$). Nor did the results show any statistically significant differences between the length of time in FIFO employment and depression ($r_s = -.041$), anxiety ($r_s = -.050$) and stress ($r_s = -.017$). This was also the case for the length of time in current job and depression ($r_s = .016$), anxiety ($r_s = .016$), and stress ($r_s = .055$) ($n = 628$, $p < 0.05$). See Tables 6.5 and 6.6 for further details.

Table 6.5 Descriptive Statistics and Spearman's rho Non-Parametric Correlation for Individual Differences and Depression, Anxiety and Stress Scales

Variable	Category	Depression				Anxiety				Stress			
		Mean	95% CI	SD	Correlation Coefficient, Sig. (2-tailed) N	Mean	95% CI	SD	Correlation Coefficient, Sig. (2-tailed) N	Mean	95% CI	SD	Correlation Coefficient, Sig. (2-tailed) N
Age					-.084*, .036, 625				-.098*, .015, 625				-.081*, .044, 625
	18-33	10.18	9.0111.35	10.17		6.39	5.54-7.23	7.33		12.00	10.8613	9.94	
	34-49	9.17	7.92-10.43	9.96		5.43	4.54-6.32	7.03		0.82	9.6511.9	9.29	
	50-65	7.57	5.70-9.43	8.79		4.61	43.31-5.9	6.12		9.04	7.15-10.94	8.93	
Years of FIFO experience					-.041, .305, 627				-.050, .211, 627				-.017, .663, 627
	0-3.5 years	9.56	8.23-10.91	10.02		6.34	5.32-7.34	7.56		.09	9.74-12.44	10.09	
	3.5-8 years	9.79	8.49-11.10	9.79		5.56	4.71-6.41	6.36		11.57	10.35-12.79	9.13	
	>8 years and over	8.81	7.37-10.25	10.00		5.32	4.27-6.37	7.25		0.64	9.26-12.01	9.54	
Years in current FIFO job					.016, .681, 28				.016,.687,628				.055, .167, 628
	0- 1 year	8.87	7.32-10.42	9.93		5.25	4.24-6.26	6.47		0.11	8.6511.87	9.33	
	1-3 years	9.79	8.50-	10.03		6.18	5.24-	7.30		.49	10.28-	9.44	
	>3 years and over	9.42	8.13-10.70	9.84		5.69	4.75-6.63	7.23		11.45	10.16-12.75	9.91	

CI = Confidence Interval; SD = Standard Deviation; *p < 0.05.

Table 6.6 *Descriptive Statistics and Group Comparisons (Mann-Whitney and Kruskal-Wallis Tests) for Individual Differences between Depression, Anxiety and Stress Scales*

Variable		Depression					Anxiety					Stress				
		Mean	95% CI	SD	Sig. P value	ts	Mean	95% CI	SD	Sig. P value	ts	Mean	95% CI	SD	Sig. P value	ts
Gender	Male	9.23	8.38-10.09	9.98	.208	30,010.500	5.72	5.10-6.33	7.17	.517	28,960.500	10.82	9.99-11.65	9.62	.054	31,151.500
	Female	10.22	8.38-12.06	9.60			6.03	4.74-7.32	6.73			12.44	10.65-14.24	9.36		
Living arrangements	Partner and children	9.01	7.76-10.27	9.97	.534	3.142	5.64	4.74-6.55	7.20	.435	3.794	10.65	9.47-11.83	9.40	.450	3.684
	Partner and no children	9.19	7.75-10.63	9.65			5.89	4.82-6.97	7.21			11.80	10.33-13.27	9.84		
	Single with and without children	10.08	8.70-11.47	10.11	.375	1.959	5.84	4.90-6.79	6.89	.800	.446	11.07	9.75-12.39	9.62	.507	.507
Education	Secondary school and below	9.94	8.57-11.30	10.38	.341	2.154	6.41	5.38-7.44	7.78	.104	4.519	11.58	10.23-12.92	10.21	.380	1.938
	Vocational	9.64	8.45-10.82	10.00			5.78	4.98-6.58	6.76			11.37	10.24-12.50	9.59		
	Tertiary	7.98	6.42-9.54	8.80			4.65	3.52-5.79	6.41			9.69	8.22-11.17	8.32		

CI = Confidence Interval; SD = Standard Deviation; ts = Test Statistic; Sig = Approximate significance; *p < 0.05

The previous analysis, to determine the relationships between individual differences and the prevalence of depression, anxiety and stress, was followed by an analysis of employment conditions. This uncovered the two key job demands (roster compression and hours worked per day), consistent with prior FIFO employee psychological health research. Analysis of the continuous DASS-21 scores entailed the Mann-Whitney test for variables with two groups and the Kruskal-Wallis test (categorical data) for variables with three or more groups. The depression, anxiety and stress scores in relation to employment conditions are displayed in Table 6.7 below.

The results showed no statistically significant differences for commute time or remuneration. Depression and anxiety symptoms were found to be statistically higher among non-managers compared to managers, and there were no differences between stress symptom levels. Depression, anxiety and stress symptoms were statistically higher among higher-compression rosters compared to medium- and low-compression rosters; and anxiety and stress symptoms were statistically higher for longer hours worked per day compared to medium and shorter hours. There were no differences between depressive symptom levels.

6.3.2 Research Question 1: Summary

The first research question asked: ‘To what extent are symptoms of depression, anxiety and stress experienced by FIFO employees self-reported?’ This was addressed by first establishing prevalence according to the scores in the moderate/ severe/ extremely severe categories; for depression (28.3 per cent), anxiety (22.3 per cent) and stress (19.4 per cent). Next, the effects of individual differences and employment conditions on depression, anxiety and stress symptoms were examined. The process identified five non-significant variables – gender, living arrangements, education, length of time spent working FIFO, and duration or length of time spent in the current job. The variables that demonstrated statistically significant effects were age, non-management compared to management positions, roster compression and the number of hours worked per day. The findings draw attention to the need for further scrutiny of these four variables in SEM theoretical models and analyses to more deeply examine their mediation and moderation effects.

Table 6.7 *Descriptive Statistics and Group Comparisons (Mann-Whitney and Kruskal-Wallis Tests) between Employment Conditions and Depression, Anxiety and Stress Scales*

Variable		Depression		Anxiety		Stress	
		Sig. (p value)	ts	Sig. (p value)	ts	Sig. (p value)	ts
Manager	Manager	.208***	38,717.000	.038***	28,960.500	.584	34,837.500
	Non-manager						
Remuneration	<\$1,500	.916	75	.949	.105	.922	.163
	\$1,500-2,4999						
	>\$2,499						
Roster	<1.4	.008***	9.750	.006***	10.173	.008***	9.782
	.41-2						
	>2.01						
Commute	0-3	.922	.162	.451	.592	.857	.309
	3.1-4.9						
	5-10						
	>10						
Hours per day	<12	.057	5.733	.049***	6.052	.003***	11.717
	12						
	>12						

ts = Test Statistic; Sig = Approximate significance; ***p <.001.

Hypothesis 1 was therefore partially supported by the evidence of participants on higher roster compressions and working longer days experiencing higher depression, anxiety and stress symptoms.

6.4 Interrelationships between Dimensions: Measurement Models

Analysis of the measurement models included factor analysis and one-factor congeneric models; further outlined in the next sections. The following measures were analysed: Adapted Adjustment Scale (AAA), Depression, Anxiety and Stress Scale (DASS-21), General Help-Seeking Questionnaire (emotional problems condition) (GHSQ-EP), General Help-Seeking Questionnaire (suicidal thoughts condition) (GHSQ-ST) and the Perception of Stigmatisation for Seeking Help (PSOSH). The findings are reported under the subheadings for each respective measure.

6.4.1 Adapted Adjustment Scale Analysis: Exploratory Factor Analysis

The Cronbach alpha coefficient for the overall Adapted Adjustment Scale (AAS) was .87, indicating good internal consistency and aligned with studies on the original scale (Black, 1988; Black & Stephens, 1989). EFA identified only one factor with an Eigenvalue over 1, rather than the three factors proposed by Behr (2012), who adapted the scale to eight items from the original 14 (Black & Stephens, 1989). The three-factor model (Black & Stephens) adjusted by Behr was not supported in this sample; the analysis demonstrated that the AAS was not able to represent the constructs of work, social and general adjustment consistently with the model's depiction of the relationship between work and social adjustment (.615**), neither between general and social adjustment (.639**) nor general and work adjustment (.556**) (** = $p < .01$ two-tailed). See Table 6.8 below.

Table 6.8 *Factor Analysis Results for Adapted Adjustment Scale*

Adjustment Scale item	Factor 1 (general adjustment)	Factor 2 (work adjustment)	Factor 3 (social adjustment)
1 Living	.90 x		
2 Housing	.87 x		
3 Food	.65 x		
4 Entertainment	.65		x
5 Social	.55		x
6 Interacting	.57	x	
7 Living away	.52		x
8 Time working	.57	x	

x indicates the factors Behr (2012) asserted the item belonged to, derived from similar items in the original questionnaire (Black, 1988; Black & Stephens, 1989).

Items 6 and 8 (work adjustment factors) were removed from the scale due to weak regression weights and high modification indices, following the technique used in previous research (for example, [Gomes et al., 2013](#); [Harms, 2010](#)), and items 1, 2, 3, 4, 6 and 7 were retained. See Table 6.9.

Table 6.9 *Exploratory Factor Analysis Results of the One-Factor Models for the AAS*

Model	Specified Yes/No	Model fit and observations	Most FLs<.60>*	Item covariance	Item FL
One factor 8-item model	No	$\chi^2 = 83.226$, $df = 1$, $p = .000$. RMSEA = .094, CFI = .97 & TLI(NNFI) = .94, p close = .000, SRMR = .043.	Yes	3 - 4	1 (.92); 2 (.89); 3 (.64); 4 (.61); 5 (.51); 6 (.54); 7 (.49); 8 (.54).
One factor 7-item model	No	$\chi^2 = 70.988$, $df = 11$, $p = .000$. RMSEA = .099, CFI = .97 & TLI(NNFI) = .93, p close = .000, SRMR = .039.	Yes	3 - 4	1 (.92); 2 (.90); 3 (.64); 4 (.60); 6 (.53); 7 (.49).

FLs – standardised factor loadings; N = 559.

6.4.2 Adapted Adjustment Scale: One-Factor Congeneric Model

The one-factor 7-item model was deemed the best possible fit for the data. Items 3 and 4 had high modification indices and were allowed to co-vary, as theoretically justified and following the procedures of [Gomes et al. \(2013\)](#) to improve the model fit. The Adapted Adjustment OCM showed an acceptable model fit and was considered correctly specified with all examined model fit indices within acceptable ranges. The RMSEA value (.059) was less than .08; CFI (.991) was

higher than .90; TLI(NNFI) (.981) was higher than .90; the p-close statistic (.268) was less than .05 and the Standardised Root Mean Square Residual (SRMR) (.022) was less than .05. A pictorial representation of the AAS OCM appears in Figure 6.2.

Adapted Adjustment Scale: Findings. The seven items retained from the AAS indicated a broad measure of adjustment, but no specific measures for work, social and general adjustment. Although there wasn't support for the three-factor model proposed by Black and Stephens (1989) and Behr (2012), the authors argued that the scale items were indicators of adjustment for a latent variable. Problems experienced with this scale may also be due to its adaptation from a 14-item to an eight-item scale – the implications of this are discussed in the following chapter. Since all the items loaded onto one factor the measure was considered a “general adjustment” and is referred to as such, rather than a social or work adjustment.

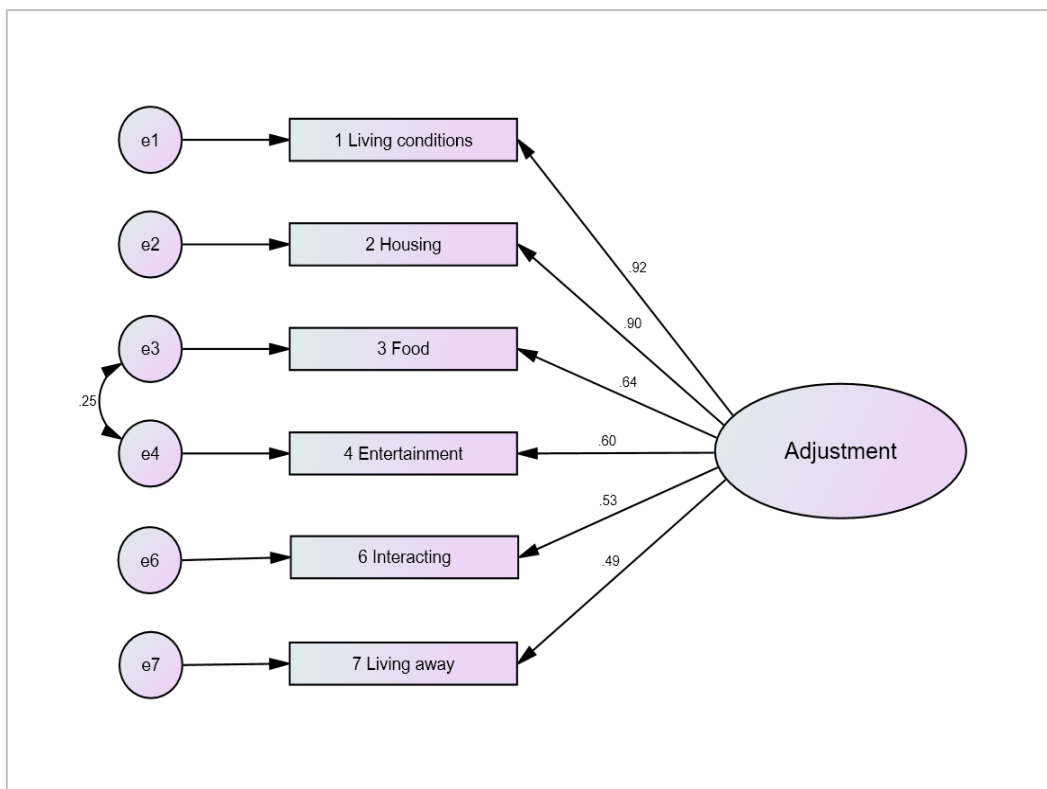


Figure 6.2 *One-Factor Congeneric Model of the Adapted Adjustment Scale*
Ellipses represent latent variables and rectangles represent manifest variables.

Depression Anxiety Stress Scale (CFA): Findings. Overall, the DASS-21 achieved a Cronbach alpha coefficient of .95**, with .92**, .83** and .90** for the depression, anxiety and stress subscales respectively. The DASS-21 demonstrated excellent internal consistency, as described in

the extant literature (Lovibond & Lovibond, 1995; Migliorini, New, & Tonge, 2009) (** = $p < .01$ two-tailed).

CFA showed support for Clark and Watson's (1991) tripartite model representing depression (measuring anhedonia and low positive affectivity), anxiety (measuring physiological hyperarousal) and stress (measuring negative affectivity) as related yet distinct constructs. The results are presented in Table 6.10 and demonstrate that the DASS-21 was able to denote the constructs of anhedonia and physiological hyperarousal consistently with the tripartite model's depiction of the relationship between anxiety and depression (.730**); anxiety and stress (.769**); and depression and stress (.819**). (See for example, Antony, Bieling, Cox, Enns, & Swinson, 1998; Lovibond & Lovibond, 1995) (** = $p < .01$ two-tailed).

Table 6.10 CFA Results of the One-Factor Models of the DASS-21

Model	Specified Yes/No	Model fit and observations	Most FLs<.60>*	Item covariance	Item FL
Depression	No	$\chi^2 = 129.242$, $df = 14$, $p = .000$. RMSEA = .121, CFI = .952 & TLI(NNFI) = .928, $p\text{-close} = .000$. SRMR = .039.	Yes	N/A	3 (.76); 5 (.57); 10 (.82); 13 (.84); 16 (.81); 17 (.81); 21 (.78).
Anxiety	No	$\chi^2 = 57.321$, $df = 14$, $p = .000$. RMSEA = .074, CFI = .969 & TLI(NNFI) = .953, $p\text{-close} = .021$. SRMR = .034.	Yes	N/A	2 (.36); 4 (.62); 7 (.69); 9 (.67); 15 (.77); 19 (.73); 20 (.77).
Stress	No	$\chi^2 = 101.274$, $df = 14$, $p = .000$. RMSEA = .106, CFI = .957 & TLI(NNFI) = .935, $p\text{-close} = .000$. SRMR = .038.	Yes	N/A	1 (.61); 6 (.72); 8 (.69); 11 (.83); 12 (.82); 14 (.72); 18 (.80).

FLs – standardised factor loadings. N = 559; N/A = Not applicable

Depression Anxiety Stress Scale (One-Factor Congeneric Models): Findings. Separate OCMs were used for each of the three subscales of the DASS-21. Given the poor model fit when the subscales were combined and the resultant multiple cross-factor loadings, a second-order model was designed. Pictorial representations of the results are shown in Appendix 4 for the depression OCM (Figure 6.3); anxiety OCM (Figure 6.4); and stress OCM (Figure 6.5). CFA supported a three-factor model for the 21-item DASS - see Table 6.11 below.

Table 6.11 *CFA Results of the Second-Order One-Factor Models of the DASS-21*

Model	Specified Yes/No	Model fit and observations	Most FLs<.60>*	Item covariance	Item FL
21 item one-factor model	Yes	$\chi^2 = 1248.333$, $df = 189$, $p = .000$, $RMSEA = .100$, $CFI = .855$ & $TLI(NNFI) = .838$, $p\text{-close} = .000$, $Standardized\ RMR = .056$.	Yes	N/A	Depression: 3 (.73); 5 (.57); 10 (.76); 13 (.80); 16 (.78); 17 (.80); 21 (.74). Anxiety: 2 (.39); 4 (.55); 7 (.58); 9 (.66); 15 (.73); 19 (.61); 20 (.67). Stress: 1 (.58); 6 (.68); 8 (.72); 11 (.77); 12 (.79); 14 (.67); 18 (.79).
Second order three-factor model (21 items)	Yes	$\chi^2 = 819.769$, $df = 186$, $p = .000$, $RMSEA = .067$, $CFI = .913$ & $TLI(NNFI) = .902$, $p\text{-close} = .019$, $Standardized\ RMR = .046$.	Yes	N/A	Depression (.91): 3 (.76); 5 (.58); 10 (.81); 13 (.84); 16 (.81); 17 (.81); 21 (.77). Anxiety (.88): 2 (.38); 4 (.61); 7 (.67); 9 (.70); 15 (.79); 19 (.71); 20 (.76). Stress (.97): 1 (.60); 6 (.71); 8 (.72); 11 (.81); 12 (.82); 14 (.71); 18 (.81).

FLs – standardised factor loadings, N = 559; N/A = Not applicable.

The second-order three-factor depression, anxiety and stress scale OCM showed good model fit and was considered correctly specified for all examined model fit indices within acceptable ranges – see Figure 6.3 below for a pictorial representation.

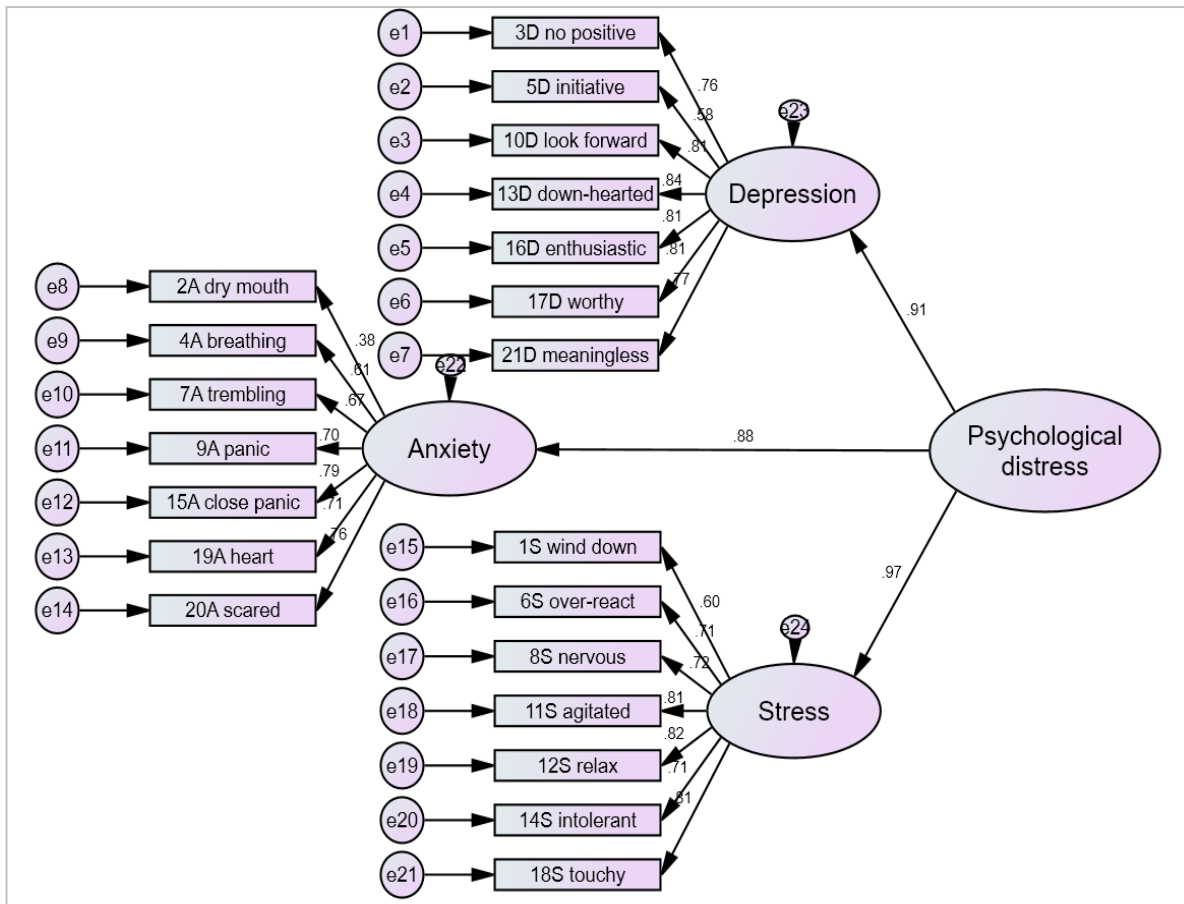


Figure 6.3 Second-Order Three-Factor Model for the Depression, Anxiety and Stress Scales

This included a RMSEA value of .067 (less than .08); CFI of .942 (higher than .90); TLI(NNFI) of .928 (higher than .90); p-close statistic of .019 (less than .05); and a Standardised Root Mean Square Residual (SRMR) of .042 (less than .05).

Depression Anxiety Stress Scale: Findings. The 21 items on the DASS-21 indicated a broad measure of psychological distress and specific measures for depression, anxiety and stress. As recommended by Lovibond and Lovibond (1995), the seven items of these three scales were specified as indicators of a latent variable for depression, anxiety and stress. Notably, some studies (e.g., Clara, Cox, & Enns, 2001) discovered that item two: “I was aware of dryness in my mouth” was one of the weakest questions on the scale, supported in the current study with a factor loading of only .39. This was one of three autonomic/physical screening questions to measure physiological symptoms of anxiety (autonomic hyperarousal – present in anxiety but not depression). It was important to determine whether the autonomic/ physical questions had confounded the findings, as discovered in prior behavioural sciences research (Clara et al., 2001; Migliorini et al., 2009). Therefore, correlations for the anxiety scale were assessed using both physical and non-physical items. The correlation between the physical items and the anxiety scale was .876 for the non-anxious group (N = 488) and .709 for the anxious group (N = 140). The correlation between the non-physical items was .603 for the non-anxious group and .790 for the anxious group. While each correlation was statistically significant ($p < 0.01$), the non-anxious group had a marginally lower association with physical symptoms than the anxious group. Despite the weak factor loading of Item 2, the close correlation between the autonomic (physical) items of anxious and non-anxious participants and the anxiety scale determined that the physical questions had not confounded the findings.

6.4.3 General Help-Seeking Scale – Emotional Problems (CFA)

For the overall General Help-Seeking Questionnaire (GHSQ), Cronbach’s alpha coefficient for emotional problems was .68. While this may cast doubt on the internal consistency of the scale (Cronbach, 1951; Gliem & Gliem, 2003), $\alpha > .6$ was deemed acceptable by [Bonett and Wright \(2015\)](#). Contrary to the anticipated two factors (formal and informal help sources), CFA of the GHSQ for emotional problems revealed three factors with Eigenvalues greater than one, the third factor presenting a “defensive profile”, including partial loading on items 1 (Intimate partner); 8 (Minister or religious leader e.g., priest, rabbi, chaplain); 9 (I would not seek help from anyone); and 10 (I would seek help from others –

please list in the space provided e.g., work colleague). Items 1 (intimate partner) and 8 (Minister or religious leader) loaded onto two factors. When only items 1 to 8 were analysed, two distinct factors emerged: informal (items 1 to 4) and formal (items 5 to 8), implying support for a two-factor model for the 8-item GHSQ. See Table 6.12 for further details.

Table 6.12 *Factor Analysis Results for GHSQ - Emotional Problems Scale*

GHSQ (Emotional Problems) Scale item	Factor 1 (Informal help source)	Factor 2 (Formal help source)	Factor 3 (Defensive profile)
1 intimate	.35		
2 friend	.59		
3 parent	.80		
4 relative	.80		
5 professional		.82	
6 helpline		.77	
7 doctor		.77	
8 religious		.39	
9 no-one			.43
10 other	.27		

6.4.4 General Help-Seeking Questionnaire – Emotional Problems: One-Factor Congeneric Models

Separate OCMs were used for each of the two factors of the GHSQ (emotional problems). CFA supported a two-factor model for the 8-item GHSQ (emotional problems) (see Table 6.13 below). A pictorial representation of the second order two-factor model is displayed in Figure 6.4. (*Note:* Pictorial representations of the informal and formal results are provided in Appendix 4).

Factor loadings for the informal scale were lower than the required $<.60$, attributed to the high covariance between the items. However, given the high co-variance between items, [Wilson et al. \(2005\)](#) argued that some redundancy among the scale items indicate the factor loadings exceed the acceptable threshold. Items within the same factor were therefore allowed to co-vary, based on this theoretical justification and this improved the model-fit. The 8-item, second order two-factor model for the GHSQ (emotional problems) was accepted as being correctly specified as all of the model fit indices were within acceptable ranges. This includes the RMSEA value (.073) is less than .08 which indicates acceptable fit; CFI (.968) is higher than .95 which indicates excellent fit; TLI(NNFI) (.981) is higher than .95 which indicates excellent fit; the p-close statistic (.029) is less than .05 and the Standardised Root Mean Square Residual (SRMR) (.048) is less than .05.

Table 6.13 Results of the OCMs and Second-Order Two-Factor Congeneric Model for the General Help-Seeking Questionnaire (Emotional Problems)

Model	Specified Yes/No	Model fit and observations	Most FLs<.60>*	Item covariance	Item FL
Informal support – Emotional Problems	No	$\chi^2 = 17.673$, df = 1, p = .000. RMSEA = .173, CFI = .968 & TLI(NNFI) = .807, p- close = .490. SRMR = .001.	No	1 – 2 1 – 4 2 – 3 3 – 4	1 (.48); 2 (.17); 3 (.18); 4 (.73).
Formal support – Emotional Problems	Yes	$\chi^2=2.055$, df= 1, p=.152. RMSEA= .043 CFI = .998 & TLI(NNFI)= .991 p- close=.405. SRMR = .011.	Yes	6 - 8	5 (.84); 6 (.74); 7 (.75); 8 (.35).
8-item 2-factor model – Emotional Problems	Yes	$\chi^2= 55.186$, df= 14, p=.000. RMSEA= .073, CFI = .968 & TLI(NNFI)= .936 p- close=.029. SRMR = .048.	No	1 – 2 1 – 4 2 – 3 3 – 4 6 - 8	Informal (.61): 1 (.60); 2 (.43); 3 (.43); 4 (.82); Formal (.77): 5 (.83); 6 (.73); 7 (.76); 8 (.35).

FLs – standardised factor loadings, N = 559; N/A = Not applicable.

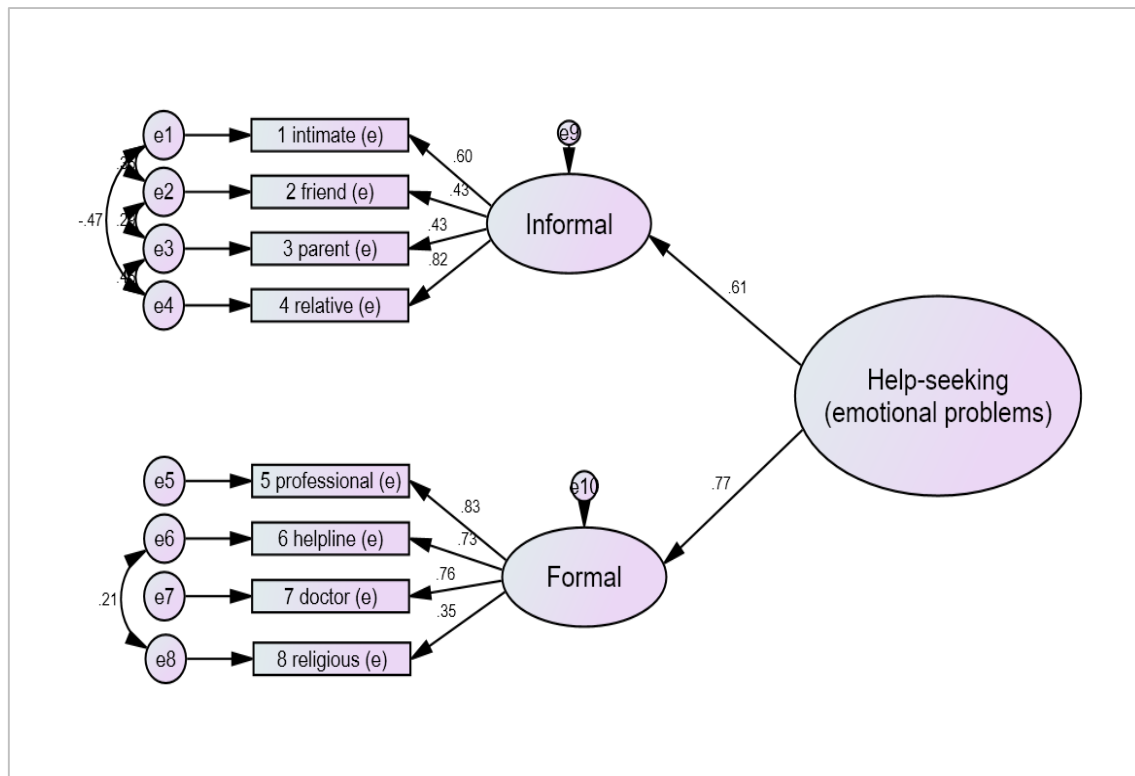


Figure 6.4 Second-Order Three-Factor Model for the General Help-Seeking Scale (Emotional Problems)

6.4.5 General Help-Seeking Scale – Suicidal Thoughts (CFA)

Cronbach's alpha coefficient for suicidal thoughts in the General Help-Seeking Questionnaire (GHSQ) was .82, indicating good internal consistency and alignment with the literature (Wilson et al., 2005). CFA of the GSHQ for suicidal thoughts identified three factors with Eigenvalues greater than one, but a slightly different profile than emotional problems in the third factor without Item 1 (Intimate Partner) and with Items 8, 9 and 10. Separate OCMs were used for each of the two GHSQ scales. When only items 1 to 8 were analysed, two distinct factors emerged: informal (items 1 to 4) and formal (items 5 to 8). See Table 6.14 underneath for further details. CFA verified a two-factor model for the 8-item GHSQ.

Table 6.14 *Factor Analysis Results of the GHSQ Suicidal Thoughts Scale*

GHSQ (Suicidal Thoughts) Scale item	Factor 1 (Informal help-source)	Factor 2 (Formal help-source)	Factor 3 (Defensive profile)
1 intimate	.59		
2 friend	.71		
3 parent	.90		
4 relative	.83		
5 professional		-.93	
6 helpline		-.78	
7 doctor		-.71	
8 religious			.48
9 no-one			.43
10 other			.49

6.4.6 General Help-Seeking Scale – Suicidal Thoughts (OCM)

Separate OCMs were used for each of the two scales of the GHSQ for suicidal thoughts and CFA supported a two-factor model for the eight-item GHSQ for this condition – see Table 6.15. A pictorial representation of the second-order two-factor model is shown in Figure 6.5. Pictorial representations of the informal and formal results are presented in Appendix 4.

Factor loadings for the informal scale were lower than the required $<.60$, attributed to the high covariance between the items. The eight-item, second-order two-factor model for the GHSQ (suicidal thoughts) was considered correctly specified, since all the examined model fit indices were within allowable ranges. These included the RMSEA value (.064), less than .08 and indicating acceptable fit; CFI (.983), higher than .95 and indicating excellent fit; TLI(NNFI) (.969), higher than .95 and indicating excellent fit; the p-close statistic (.115), less than .05; and the Standardised Root Mean Square Residual (SRMR) (.036), less than .05.

Table 6.15 Results of the OCMs and Second-Order Two-Factor Congeneric Model for the GSHQ (Suicidal Thoughts)

Model	Specified Yes/No	Model fit and observations	Most Ls <.60>*	Item covariance	Item FL
Informal support – Suicidal thoughts	No	$\chi^2 = 3.068$, $df = 1$, $p = .000$. RMSEA = .061, CFI = .998 & TLI(NNFI) = .987, p-close = .286. SRMR = .001.	No	3 - 4	1 (.70); 2 (.83); 3 (.73); 4 (.72).
Formal support – Suicidal thoughts	Yes	$\chi^2 = 2.828$, $df = 1$, $p = .152$. RMSEA = .057, CFI = .998 & TLI(NNFI) = .987, p-close = .310. SRMR = .013.	Yes	5 - 8	5 (.90); 6 (.76); 7 (.75); 8 (.47).
8- item 2-factor model - Suicidal thoughts	Yes	$\chi^2 = 49.008$, $df = 15$, $p = .000$. RMSEA = .064, CFI = .983 & TLI(NNFI) = .969, p-close = .115. SRMR = .036.	No	3 - 4 5 - 8	Informal (.77): 1 (.59); 2 (.69); 3 (.60); 4 (.66). Formal (.63): 5 (.84); 6 (.75); 7 (.73); 8 (.46).

FLs – standardised factor loadings, N = 559; N/A = Not applicable.

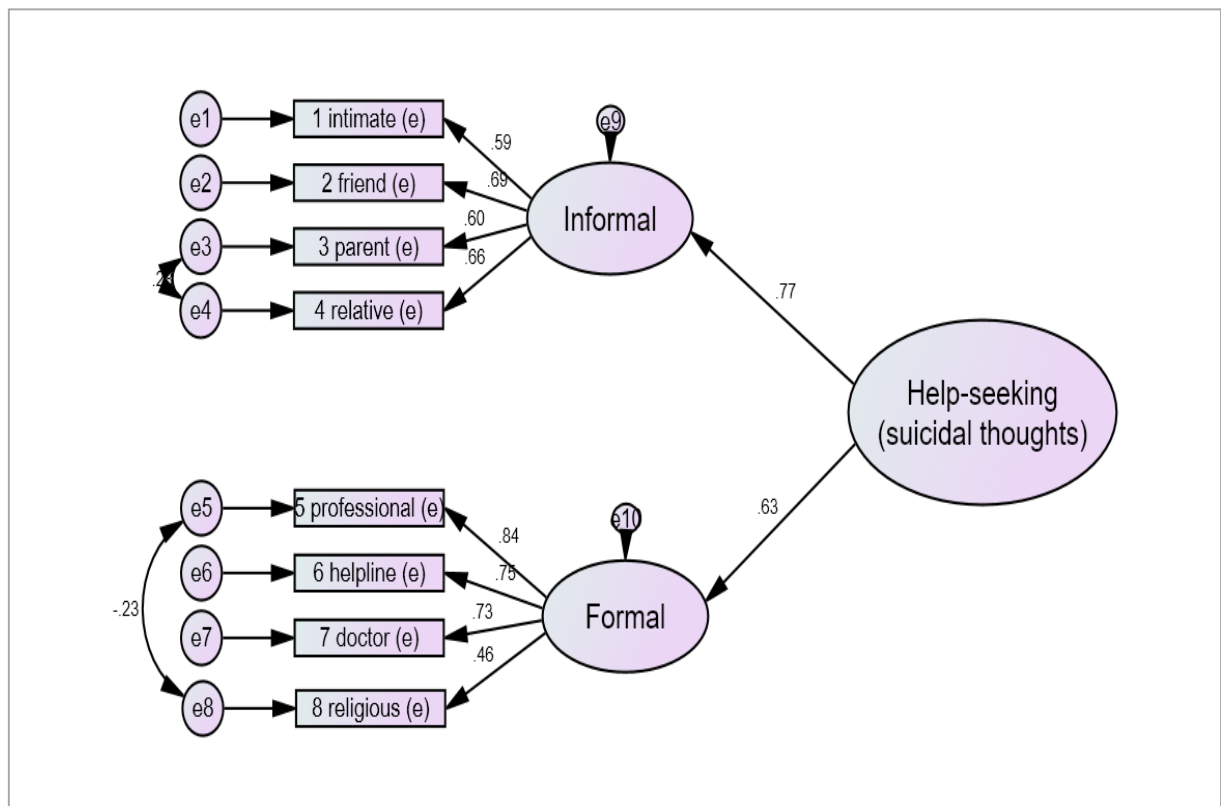


Figure 6.5 Second-Order Three-Factor Model for the General Help-Seeking Scale (Suicidal Thoughts)

General Help-Seeking Scale – Suicidal Thoughts: Findings. The GHSQ indicated a broad measure of help-seeking intentions, help-source preferences and behaviour. As proposed by Wilson et al. (2005), the scales were specified as indicators of a latent variable for help-seeking in relation to suicidal thoughts items. Due to items loading onto a third factor, two items were removed according to the procedures of Gomes et al. (2013). The second-order two-factor models for both the GHSQ scales (suicidal thoughts) demonstrated excellent fit.

6.4.7 Perceptions of Stigmatisation by Others for Seeking Psychological Help: (CFA)

Cronbach's alpha coefficient was .91** for the overall Perceptions of Stigmatisation by Others for Seeking Psychological Help (PSOSH), indicating excellent internal consistency and alignment with the literature (Vogel, Wade, & Ascherman, 2009) (** = $p < .01$ two-tailed). CFA identified the presence of only one factor in the PSOSH. Items with high modification indices were allowed to co-vary as they were part of the same factor, thereby theoretically justified for improving model fit. See Table 6.16 for details.

Table 6.16 *Results of the One-Factor Congeneric Models for the Perceptions of Stigmatisation by Others for Seeking Psychological Help*

Model	Specified Yes/No	Model fit and observations	Most FLs<.60>*	Item covariance	Item FL
Stigma – five item	Yes	$\chi^2 = 1.503$, $df = 1$, $p = .220$. RMSEA = .030 CFI = 1.000 & TLI(NNFI) = .997, $p\text{-close} = .490$. SRMR = .004.	Yes	1 - 2 2 - 5 3 - 4 3 - 5	1 (.79); 2 (.85); 3 (.82); 4 (.93); 5 (.67).

FLs – standardised factor loadings; N = 559.

6.4.8 Perceptions of Stigmatisation by Others for Seeking Psychological Help: One-Factor Congeneric Model

The five-item, one-factor model for the PSOSH scale was considered correctly specified, since all the examined model fit indices were within allowable ranges. These included the RMSEA value (.030), less than .05; CFI (1.000), exceeding .95; TLI(NNFI) (.997), exceeding .95; the $p\text{-close}$ statistic (.490), less than .05; and the Standardised Root Mean Square Residual (SRMR) (.004), less than .05. The model was determined to be an excellent fit. The OCM for stigma is depicted in Figure 6.6.

Perception of Stigmatisation by Others for Seeking Help: Findings. The PSOSH is a broad measure of stigma. As reported by Vogel et al. (2009), the five items included in the scale were specified as indicators of a latent variable for stigma, and once item covariance was permitted, the scale demonstrated excellent fit.

6.5 Construct Validity and Reliability

The validity of the measures used in the current study was assessed to ensure there were no concerns with construct reliability and discriminant validity prior to SEM analysis. This is important in order to determine whether a latent variable accounts for variance in the observed variables associated with it, rather than other related constructs. If not, the validity of the items and the latent construct become questionable (Fornell & Larcker, 1981). For this reason, the AAS, DASS-21, PSOSH and GHSQ were examined separately for both suicidal thoughts and emotional problems.

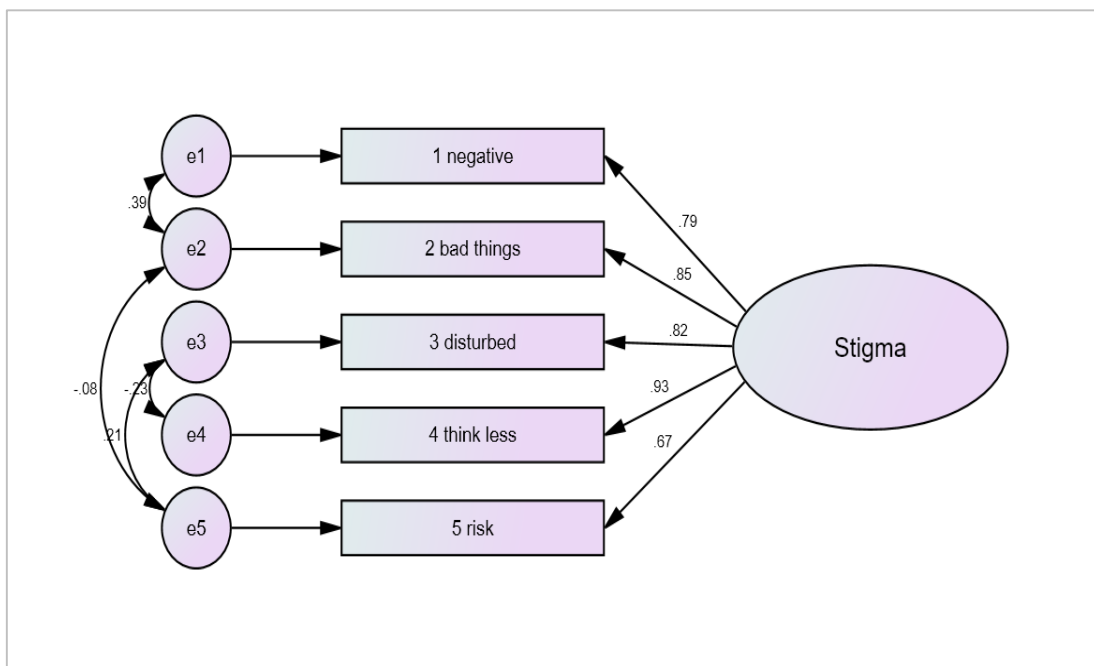


Figure 6.6 One-Factor Congeneric Model for the Perception of Stigmatisation by Others Scale

The AAS, DASS-21, GHSQ (emotional problems) and PSOSH were correlated and the model found to fit the data well (χ^2 (723 df) = 1498.8, $p = .000$; RMSEA = .04, CFI = .94 and TLI(NNFI) = .93, p -close = .999. SRMR = .046). All the standardised factor loadings were

significant, ranging from 0.38 – 0.96, indicating the appropriate use of this model. However, one difficulty arose when the construct reliability and discriminant validity for the six-item AAS could not be ascertained ($CR = 0.843$), because the AVE (0.488) was lower than the required 0.50. The AVE is the traditional test of discriminant validity (Fornell & Larcker, 1981). While an AVE above 0.50 is certainly preferred (Anderson & Gerbing, 1988; Ping, 2009), an AVE close to the cut-off point (0.50) is not necessarily a problem in a new model, particularly a “first-time” study or when it does not cause major discriminant validity problems. One option for improving the AVE is to use a “jack-knife-like” procedure, by dropping cases from the data set and re-testing the remaining ones (Efron, 1981). However, this was not adopted due to its potential impact on the representativeness of the sample. Another recommended option is to delete the most problematic item on the scale, usually the item with the largest error term (Ping, 2009). While deleting items can cause difficulties if the resulting data fit the operational or conceptual definition less well, this is nevertheless an appropriate option, particularly when the AVE is close to 0.50 (Ping, 2009).

Following this logic, the AAS was re-inspected and the item with the highest error term (Item 7) was deleted. The latent factors were again correlated and assessed, and this time, the construct reliability and discriminant validity for the five-item AAS could be determined ($CR = 0.848$), because the AVE (0.539) had increased to over 0.50. Construct reliability and discriminant validity for all the measures were ascertained, including DASS-21 ($CR = 0.944$, AVE 0.848), eight-item GHSQ (emotional problems) ($CR = 0.900$, AVE 0.840) and PSOSH ($CR = 0.909$, AVE 0.669) – see Table 6.17 below. The re-correlated model fitted the data well and was virtually unchanged after deleting Item 7 from the AAS (χ^2 (680 df) = 1429.7, $p = .000$; RMSEA = .04, CFI = .94 & TLI(NNFI) = .93, $p\text{-close} = .999$. SRMR = .042). All the standardised factor loadings were significant, ranging from 0.38 – 0.96, indicating appropriateness of the model.

Table 6.17 *Factor Correlation Table for Emotional Problems Showing (in Parentheses) the Construct Reliability (CR) and Average Variance Extracted (AVE) for Each Latent Variable*

Measure	1	2	3	4
1 GSHQ (emotional problems)	0.917 (0.900, 0.840)			
2 DASS-21	-0.281	0.921 (0.944, 0.848)		
3 PSOSH	-0.292	0.527	0.818 (0.909, 0.669)	
4 AAS	0.108	-0.203	-0.092	0.734 (0.848, 0.539)

Next, the six-item AAS, DASS-21, GHSQ (suicidal thoughts) and PSOSH were correlated, and the model was found to fit the data well (χ^2 (683 df) = 1469.4, $p = .000$; RMSEA = .04, CFI = .94 & TLI(NNFI) = .93, $p\text{-close} = .993$, SRMR = .042). All the standardised factor loadings were significant, ranging from 0.37 – 0.96, indicating suitable use of this model. Overall, construct reliability and discriminant validity for the six-item AAS, DASS-21, eight-item GHSQ (suicidal thoughts) and PSOSH were validated – see Table 6.18.

Table 6.18 *Factor Correlation Table for Suicidal Thoughts Showing (in Parenthesis), the Construct Reliability (CR) and Average Variance Extracted (AVE) for Each Latent Variable*

Measure	1	2	3	4
1 GSHQ (suicidal thoughts)	0.839 (0.824, 0.704)			
2 DASS-21	-0.310	0.921 (0.944, 0.849)		
3 PSOSH	-0.338	0.527	0.818 (0.909, 0.669)	
4 AAS	0.127	-0.203	-0.092	0.734 (0.847, 0.538)

A test of common method variance was performed and results showed that the per cent of variance explained by the combined factors in factor analysis was only 42.27 (lower than the cut off of 50 per cent) which indicates the common method variance is within acceptable limits (Gaskin, 2011).

6.6 Structural Analysis

Structural Equation Modelling (SEM) was useful in the context of this analysis because it allowed multiple concurrent tests between variables ([Arbuckle, 2007](#); [Lowry & Gaskin, 2014](#)). The structural models were analysed using SEM, first to model the data in keeping with the hypothesised relationships, and second, to assess mediation effects.

The purpose of analysing the structural models was to examine the relationships between the processes of adjustment, psychological distress, stigma and help-seeking. In developing the conceptual model from the literature, it was hypothesised that adjustment negatively relates to psychological distress, and both psychological distress and stigma negatively relate to help-seeking. A structural analysis was conducted on a composite model ([Lowry & Gaskin, 2014](#)). Combining the two conditions of the GHSQ (emotional problems and suicidal thoughts) was also a consideration, but they were retained for precision, due to significant differences between the two conditions revealed by pairwise comparison, as well as the differences in Construct Reliability (CR) and Average Variance Extracted (AVE) as outlined above.

Structural Model 1 tested the relationships between adjustment, psychological distress (depression, anxiety and stress), stigma and help-seeking. It controlled for significant individual differences and employment conditions, i.e., gender, age, management role, roster compression and the number of hours worked per day (see Figure 6.7).

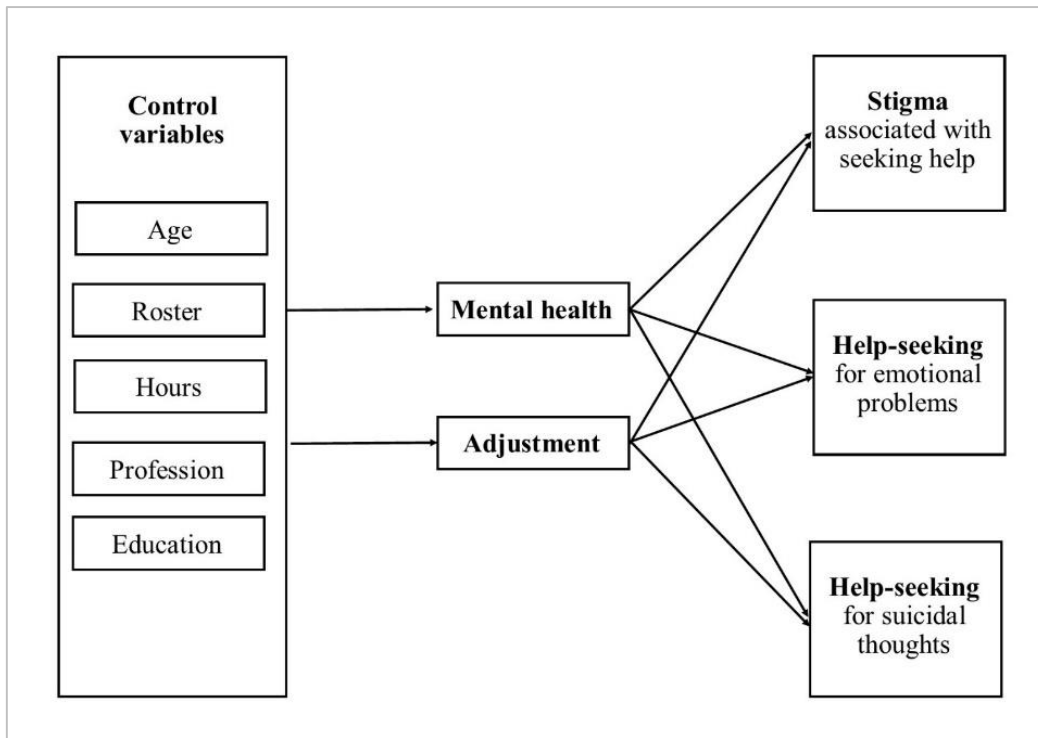


Figure 6.7 SEM Model 1

The model demonstrated good fit and was considered correctly specified, as the all model fit indices were within allowable ranges. These included the RMSEA value below .05 (.04), indicating excellent fit; CFI above .90 (.98), indicating acceptable fit; TLI(NNFI) above .90 (.96), indicating acceptable fit; p-close statistic above .05 (.82); and the Standardised Root Mean Square Residual (SRMR) below .05 (.04). Model fit indices and pathways are shown in Table 6.19.

Model 1 showed that poor adjustment predicts higher psychological distress, and in turn, higher psychological distress predicts more perceived stigma associated with seeking help. Understanding the causes and consequences of the components of psychological distress was achieved by using Model 2 (see Figure 6.8) to examine the relationships between adjustment, depression, anxiety, stress, stigma and help-seeking. The model demonstrated good fit and was considered correctly specified. It confirmed the existence of significantly different help-seeking intentions, depending on the type of psychological distress being experienced. Model fit indices and pathways are reported in Table 6.19.

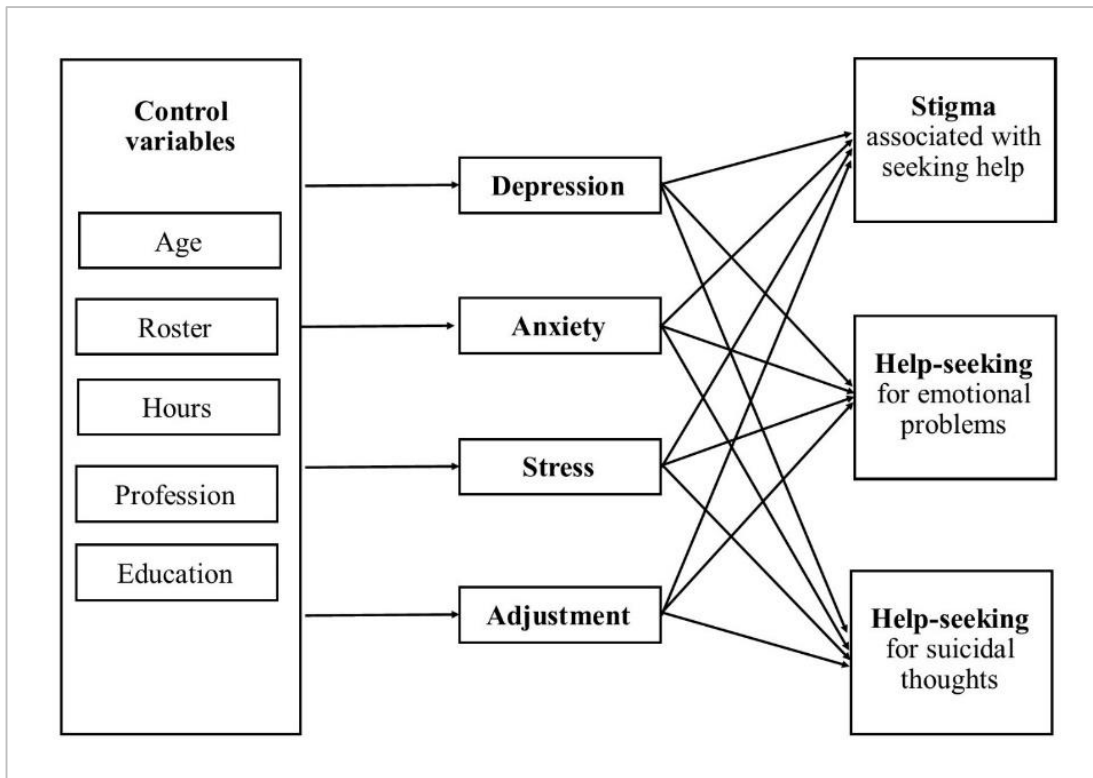


Figure 6.8 SEM Model 2

Table 6.19 *Model Fit Indices: Associations between Adjustment, Psychological Distress, Stigma and Help-Seeking*

Model	χ^2 (df)	p	RMSEA	CFI	TLI (NNFI)	p-close	SRMR	Significance of pathways observed between latent variables (β)
Model 1	26.07 (15)	.037	.04	.98	.96	.82	.04	Adjustment to psychological distress ($\beta = -.16^{***}$); Adjustment to stigma ($\beta = -.02$, $p = .634$); Psychological distress to stigma ($\beta = .49^{***}$); Psychological distress to help-seeking (ep) ($\beta = -.06$, $p = .207$). Psychological distress to help-seeking (st) ($\beta = -.12$, $p = .013$); Stigma to help-seeking (ep) ($\beta = -.22^{***}$). Stigma to help-seeking (st) ($\beta = -.21^{***}$); Adjustment to help-seeking (ep) ($\beta = .08$, $p = .060$); Adjustment to help-seeking (st) ($\beta = .07$, $p = .090$).
Model 2	28.43 (15)	.019	.40	.99	.97	.74	.03	Adjustment to depression ($\beta = -.19^{***}$); Adjustment to anxiety ($\beta = -.07$, $p = .077$); Adjustment to stress ($\beta = -.17^{***}$); Adjustment to stigma ($\beta = .01$, $p = .875$); Depression to stigma ($\beta = .26^{***}$); Anxiety to stigma ($\beta = .16$, $p = .006$); Stress to stigma ($\beta = .11$, $p = .102$); Stigma to help-seeking (ep) ($\beta = -.20^{***}$); Stigma to help-seeking (st) ($\beta = -.19^{***}$); Depression to help-seeking (ep) ($\beta = -.17$, $p = .016^*$); Depression to help-seeking (st) ($\beta = -.23$, $p = .001^*$); Anxiety to help-seeking (ep) ($\beta = .06$, $p = .301$); Anxiety to help-seeking (st) ($\beta = .07$, $p = .233$); Stress to help-seeking g(ep) ($\beta = .02$, $p = .772$); Stress to help-seeking (st) ($\beta = .01$, $p = .939$).

*** = $p < .001$; * = $p < .05$; CFI = Comparative Fit Index; TLI(NNFI) = Tucker-Lewis Index (Non-Normed Fit Index); RMSEA = Root-Mean-Square Error of Approximation; SRSM = Standardised Root Mean Square Residual.

The SEM analysis provided results for hypothesis 2. Table 6.19 shows the results of the structural models, and as theorised, negative adjustment was related to psychological distress. The standardised regression coefficient of $-.16^{***}$ for Adjustment \rightarrow Psychological Distress meant that for one standard deviation decrease in Adjustment there was a .16 standard deviation increase in Psychological Distress, a mild, yet distinct effect. When mental disorders were separated, a stronger effect was observed for depression ($\beta = -.19^{***}$), followed by stress ($\beta = -.17^{***}$) and anxiety ($\beta = -.07$, $p = .077$). Accordingly, hypothesis 2: “FIFO employees’ adjustment relates negatively to depression, anxiety and stress symptoms, such that employees reporting lower adjustment experience higher symptoms” was supported.

The results revealed differences between the two help-seeking conditions emotional problems and suicidal thoughts. All the examined relationships were negatively related, indicating the higher the symptoms of depression, anxiety and stress experienced, the lower the help-seeking intention. For emotional problems the relationship between depression ($\beta = -.17$, $p = .016^*$) and help-seeking was weak but significant, while for anxiety ($\beta = .06$, $p = .301$) and stress ($\beta = .02$, $p = .772$) the relationship was mild to weak and not significant. For suicidal thoughts the relationships between anxiety ($\beta = .07$, $p = .233$), stress ($\beta = .01$, $p = .939$) and help-seeking were also weak and not significant. However, the relationship between depression ($\beta = -.23^*$) and help-seeking related to the suicidal thoughts condition was significant.

In relation to hypothesis 3, the standardised regression coefficient of $-.23^*$ for Depression \rightarrow Help-seeking (suicidal thoughts) showed that for a one standard deviation increase in depression there was a .23 standard deviation decrease in help-seeking intention, a mildly strong and substantial effect. This finding indicates a significant difference at the decision-making stage for individuals regarding their intention to seek help for emotional problems compared to suicidal thoughts. As such, hypothesis 3 was partially supported: “Levels of help-seeking intentions for emotional problems will be higher among FIFO employees with lower levels of depression, anxiety and stress symptoms when compared with suicidal thoughts.” As far as hypothesis 5 was concerned, the results demonstrated that stigma levels varied depending on the type of psychological distress being experienced. Depression ($\beta = .26^{***}$) was linked to higher perceptions of stigma, while anxiety ($\beta = .16$, $p = .006$) and stress ($\beta = .11$, $p = .102$) had little effect. Therefore, hypothesis 4 was supported: “The preference for informal help-seeking will be higher among males compared to females, and the preference for formal help-seeking will be higher among females compared to males”, with a weaker relationship for anxiety and stress and a stronger relationship for depression.

Research Question 2: Summary

The structural models were analysed to examine the relationships between adjustment, psychological distress, stigma and help-seeking. The results showed adjustment was mildly and negatively related to psychological distress, and psychological distress and stigma were both mildly and negatively related to help-seeking. The relationship between psychological distress and stigma was found to be moderately strong and negative. In addition, mediation analysis confirmed that stigma mediated the relationship between psychological distress and help-seeking intentions. Therefore, participants who indicated high levels of psychological distress were more likely to experience stigma, with higher levels of stigma translating into less likelihood of seeking help. Overall, the relationships hypothesised in the conceptual model were confirmed by the data, and the results confirmed support for hypothesis 2, partial support for hypothesis 3, and support for hypothesis 4.

6.7 Mediation Effects: Stigma and Gender

6.7.1 Stigma

In support of hypothesis 5, the findings did indicate that stigma mediated the relationship between psychological distress and help-seeking for both emotional problems and suicidal thoughts. Participants who indicated high levels of psychological distress were therefore more likely to experience stigma, and due to higher levels of stigma, less likely to seek help. Squared multiple correlations analysis showed the variance, explained by the effect of psychological distress on stigma, was 24 per cent ($r = .24$). The percentage of the variance explained by the effect of psychological distress and stigma on help seeking for emotional problems was 13% ($r = .13$) and for suicidal thoughts, 17% ($r = .17$). See Table 6.20.

Table 6.20 *Mediating Effects of Stigma on Psychological Distress and Help-Seeking*

DV	Estimate	Lower 95% CI	Upper 95% CI	P value	SE	Bias
Emotional Problems	-.131	-.183	-.086	.001	.029	.002
Suicidal Thoughts	-.175	-.246	-.118	.001	.039	.002

The mediation analysis reflected the expected mediations described in the literature and supported hypothesis 5: “Stigma mediates the negative effect of psychological distress and help-seeking”.

6.7.2 Gender

Differences in the relationships between mental health problems, stigma, and formal and informal help-seeking preferences for men compared to women are depicted in Figure 6.9.

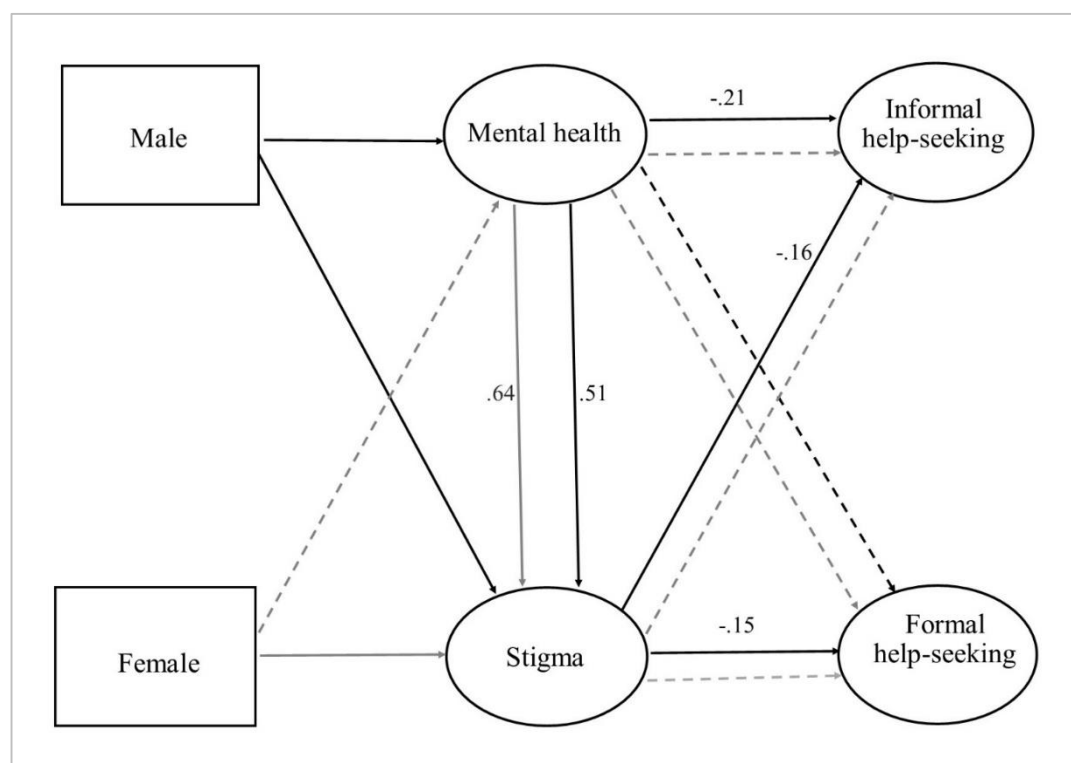


Figure 6.9 Model 3: Multi-Group Pathway Analysis of Gender Differences

Displayed coefficients are standardised path coefficients. Dotted lines represent non-significant parameters. Black lines represent males and grey lines represent females.

The multi-group analysis demonstrated acceptable fit (Chi-square = (984 df) 1816.425, $p = .000$; RMSEA = .04, CFI = .92 & TLI (NNFI) = .91, p-close = 1.00. SRMR = .0460). For males, significant pathways were identified between mental health problems and stigma ($\beta = .51$, $p < .01$); between mental health problems and informal support ($\beta = -.21$, $p < .01$); between stigma and informal support ($\beta = -.16$, $p < .01$); and between stigma and formal support ($\beta = -.15$, $p < .01$, $p < .05$). The pathway between mental health problems and formal support ($\beta = .01$, $p = .78$) was not significant. For females, a significant pathway was identified between mental health problems

and stigma ($\beta = .64, p < .01$). The pathways between mental health problems and informal support ($\beta = .02, p = .83$); between mental health problems and formal support ($\beta = -.02, p = .85$); between stigma and informal support ($\beta = -.29, p = .06$); and between stigma and formal support ($\beta = -.13, p = .26$) were not significant.

Critical ratio analysis confirmed a significant difference between males and females in the pathway between mental health problems and informal support ($z = 2.01$) ($p < .001$). The results highlighted significant differences between genders for the relationship between mental health problems and informal support. However, there were no significant differences in the relationship between mental health problems and formal support. Hypothesis 6(a): “Differences exist between genders for informal help-seeking preferences” was therefore supported, while hypothesis 6(b): “Differences exist between genders for formal help-seeking preferences” was not supported.

6.8 Mental Health Prevalence Rates

The participants who scored the highest (ceiling) and lowest (floor) on the DASS-21 were assessed. According to previous studies that used the DASS-21, for example ([Parkitny et al., 2012](#); [Sinclair et al., 2010](#)), when a large number of participants score at either the ceiling or floor, the items do not appropriately evaluate the range of the construct of interest within that population. In this study, few participants scored at the ceiling for the three DASS-21 scales ($N = 4, 0$, and 3 for Depression, Anxiety, and Stress, respectively), yet significantly higher numbers of participants scored at the floor ($N = 130, 175$, and 70 for Depression, Anxiety and Stress, respectively). For the total DASS-21 score (the sum of the three subscales), 40 participants scored at the floor, lower than several published studies ([for example, Sinclair et al., 2010](#)), although [Henry and Crawford \(2005\)](#) advised this could be expected in non-clinical samples. Consequently, the proportion of the sample at the floor (40 participants) and ceiling (7 participants) signalled that the measure exhibited some floor and ceiling effects.

The final sample of the DASS-21 excluded participants who scored at the floor and ceiling levels for all three subscales, because their item responses did not vary and their standard errors were infinite ([Parkitny et al., 2012](#)). It was also important to remove the ceiling and floor effects prior to SEM analysis, because of its reliance on relationships within cases between variables to establish the relationships of interest (Bagozzi & Yi, 2012). It was anticipated that “sacrificing” these cases would allow the remaining data to provide a more accurate understanding of the relationships between variables.

Since the CFA was performed prior to analysing the structural models and SEM relies on the relationships between variables, analysis of the measurement models was performed on the sample of 559 participants.

6.9 Influence of FIFO Employment Conditions

The third and final research question posed by the current study was: “What is the influence of job demands on the relationships between adjustment, psychological distress, stigma and help-seeking among FIFO employees?” The descriptive statistical analysis illustrated that the hypothesised job demands (roster compression and hours worked a day) were significantly related to psychological distress. This section examined how job demands moderated the influence of adjustment, psychological distress, stigma and help-seeking on the basis of help-seeking theory. Prior research (e.g., Ng, Ang, & Chan, 2008) has shown that job demands can moderate the mediating effects between psychological processes. The current research hypothesised that stigma would mediate the effects of psychological wellbeing on help-seeking intentions because stigma is a substantial attitudinal barrier and this results was confirmed (please see Section 6.7.1). As job demands have been shown to have a moderating effect on such processes (Ng, Ang, & Chan, 2008) it was also hypothesised that job demands may effect the relationships between stigma, psychological wellbeing and help-seeking intentions.

Using TPB as a theoretical framework and building on research by Britt et al. (2008), SEM was used to examine how moderated mediation occurred in the structural model. The job demands (FIFO employment conditions) that were selected for the moderated mediation analysis were identified as being both theoretically valid (for example, likely to induce strain in previous JD-R and FIFO employee studies) as well as being statistically significant in the current data sample. The employment conditions used for analysis were roster compression (developed from research by Henry et al, 2013) and the number of hours worked per day (developed by research by Peetz et al. 2012). A moderation analysis between adjustment, psychological distress, stigma and help-seeking was therefore performed, using the following indicators of job demands:

- Roster compression (measured at three levels); and
- The number of hours worked per day (measured at three levels).

Higher compression rosters (e.g., four weeks at work, one week at home) and longer working hours (e.g., more than 12 hours per day) were considered higher demands. A moderated mediation analysis tested whether the relationship between high job demands and help-seeking was stronger when participants experienced high levels of mental health symptoms. The precision of the analysis was conducted with a 95 per cent confidence interval.

6.9.1 Roster Compression

The unit of measurement used was the ratio of time spent at work to time spent away from work. A ratio of less than 1.4 was classified as a low-compression roster, a ratio of 1.41 - 2 was classified as a medium-compression roster, and a ratio of more than 2.01 was classified as a high-compression roster. In order to use the same unit of analysis, the three groups of participants were unequally distributed: low ($N = 269$), medium ($N = 205$) and high ($N = 95$). The negative relationship between psychological distress and help seeking (i.e., higher psychological distress symptoms leading to lower help seeking) was enhanced by increased roster compressions, so that participants on higher-compression rosters were less likely to seek help.

Critical ratio analysis revealed a significant difference between participants on low and medium compression rosters in the pathway between psychological distress and help-seeking ($z = -2.138, p < .05$). A significant difference was also identified between participants on low and high compression rosters in the pathway between psychological distress and help-seeking ($z = -2.138, p < .05$ versus $z = -2.263, p < .05$). No significant difference was found between participants on medium and high compression rosters in the pathway between psychological distress and help-seeking ($z = -0.829, p > .10$). See Table 6.21. In addition, critical ratio analysis revealed a significant difference between participants on medium- and high-compression rosters in the pathway between adjustment and psychological distress ($z = 2.088, p = N.S.$) and a strong negative relationship for medium- compression rosters.

Table 6.21 *Moderated Multi-Group Mediation Analysis: Roster*

Hypothesis	Direct beta w/out mediator	Direct beta with mediator	Indirect beta	Mediation type observed
Low roster compression (N = 259)				
Partial mediation psychological distress→help-seeking	-.179 (p=.048*)	.049 (p=.656)	-.207 (p=.163)	No mediation
Full mediation adjustment→stigma	-.155 (p=.020*)	-.046 (p=.449)	-.102 (p=.016*)	Full mediation
Medium roster compression (N = 205)				
Partial mediation psychological distress→help-seeking	-.282 (p=.003*)	-.187 (p=.074)	-.089 (p=.100)	No mediation
Full mediation adjustment→stigma	-.153 (p=.048*)	.029 (p=.703)	-.160 (p=.058)	Full mediation
High roster compression (N = 95)				
Partial mediation psychological distress→help-seeking	-.495 (p<.001***)	-.320 (p=.032*)	-.174 (p=.061)	No mediation
Full mediation adjustment→stigma	-.044 (p=.691)	.043 (p=.640)	-.002 (p=.819)	Full mediation

* = $p < .05$; *** = $p < .001$; Adjustment→stigma (IV = CA; M = PD; DV = S); Psychological distress→help-seeking (IV = PD; M = S; DV = HS)

6.9.2 Hours Worked Per Day

To situate this analysis in a true industry context, the three groups of participants were unequally distributed as follows: low (<12 hours, N = 72), medium (12 hours, N = 341) and high (>12 hours, N = 146). Critical ratio analysis revealed a significant difference between participants who worked less than 12 hours a day and those who worked 12 hours a day in the pathway between adjustment and psychological distress ($z = -2.272$, $p < .05$). A significant difference was also identified in the same pathway between participants who worked fewer than 12 hours a day and those who worked more than 12 hours a day ($z = -2.073$, $p < .05$). The negative relationship between adjustment and psychological distress was stronger for participants who work longer hours, so that those who experienced higher adjustment also experienced lower psychological distress symptoms.

A significant difference was also observed between participants who worked fewer than 12 hours and those who worked more than 12 hours a day in the pathway between stigma and help-seeking ($z = -2.611$, $p < .001$), and in the same pathway between participants who worked 12 hours and those who worked more than 12 hours a day ($z = 4.059$, $p < .001$). See Table 6.22.

Table 6.22 Moderated Multi-Group Mediation Analysis: Hours Worked Each Shift

Hypothesis	Direct beta without mediator	Direct beta with mediator	Indirect beta	Mediation type observed
Less than 12 hours				
Partial mediation psychological distress→help-seeking.	-.435 (p=.006*)	-.186 (p=.277)	-.251 (p=.163)	No mediation
Full mediation adjustment→stigma.	.042 (p=.735)	.089 (p=.408)	-.044 (p=.215)	No mediation
12 hours				
Partial mediation psychological distress→help-seeking.	-.256 (p<.001***)	-.021 (p=.794)	-.213 (p=.031*)	Full mediation
Full mediation adjustment→stigma.	-.121 (p=.040*)	-.026 (p=.630)	-.084 (p=.382)	Full mediation
More than 12 hours				
Partial mediation psychological distress→help-seeking.	-.262 (p=.041*)	-.359 (p=.026*)	.088 (p=.434)	
Full mediation adjustment→stigma.	-.247 (p=.006*)	-.015 (p=.861)	-.202 (p=.058)	Full mediation

* = p <.05; *** = p <.001; Adjustment→stigma (IV = CA; M = PD; DV = S); Psychological distress→help-seeking (IV = PD; M = S; DV = HS)

The strength of the negative relationship between stigma and help-seeking was stronger for participants who worked fewer hours, so that those who worked longer hours were less likely to seek help due to stigma. The results of the moderated mediation analysis and critical ratios demonstrated that the tested job demands influenced the strength of the mediation in the empirical model. See Table 6.23.

Table 6.23 Critical Ratios Table: Roster Compression and Hours Worked a Day

Roster compression	Estimate	P	Estimate	P	z
	Low		Medium		
A→PD	-0.118	0.005	-0.220	0.000	-1.491
PD→S	0.978	0.000	0.955	0.000	-0.115
A→S	-0.040	0.537	0.068	0.458	0.962
S→HS	-0.240	0.003	-0.143	0.091	0.824
PD→HS	0.093	0.440	-0.340	0.037	-2.138**
	Medium		High		
A→PD	-0.220	0.000	0.001	0.987	2.088**
PD→S	0.955	0.000	1.257	0.000	1.011
A→S	0.068	0.458	0.078	0.630	0.053
S→HS	-0.143	0.091	-0.218	0.069	-0.510
PD→HS	-0.340	0.037	-0.615	0.033	-0.829

	Low		High		
A→PD	-0.118	0.005	0.001	0.987	1.184
PD→S	0.978	0.000	1.257	0.000	0.983
A→S	-0.040	0.537	0.078	0.630	0.678
S→HS	-0.240	0.003	-0.218	0.069	0.154
PD→HS	0.093	0.440	-0.615	0.033	-2.263**
Hours worked each day	Less than 12 (low)		12.000 (med)		
A→PD	-0.052	0.553	-0.102	0.003	-0.538
PD→S	1.098	0.000	1.118	0.000	0.066
A→S	0.123	0.419	-0.015	0.817	-0.833
S→HS	-0.293	0.027	-0.357	0.000	-0.409
PD→HS	-0.294	0.237	-0.099	0.527	0.662
	12.000 (med)		More than 12 (high)		
A→PD	-0.102	0.003	-0.289	0.000	-2.272**
PD→S	1.118	0.000	0.825	0.000	-1.469
A→S	-0.015	0.817	-0.004	0.965	0.093
S→HS	-0.357	0.000	0.115	0.168	4.059***
PD→HS	-0.099	0.527	-0.340	0.019	-1.125
	Less than 12 (low)		More than 12 (high)		
A→PD	-0.052	0.553	-0.289	0.000	-2.073**
PD→S	1.098	0.000	0.825	0.000	-0.905
A→S	0.123	0.419	-0.004	0.965	-0.704
S→HS	-0.293	0.027	0.115	0.168	2.611***
PD→HS	-0.294	0.237	-0.340	0.019	-0.160

A = Adjustment; PD = Psychological Distress; S = Stigma; HS = Help Seeking; z = z-statistic; *** p-value < 0.01; ** p-value < 0.05; * p-value < 0.10.

Hypothesis 7a, higher compression rosters and hypothesis 7b), longer working hours a day, were therefore supported by the strengthened negative effects of stigma on psychological distress and help-seeking.

Research Question 3: Summary

The moderated multi-group mediation analysis examined how job demands controlled the influence of adjustment, psychological distress, stigma and help-seeking on the basis of PSC and help-seeking theory. Job demands, identified as roster compression and number of hours worked a day, showed an increase in the negative relationship between psychological distress and help-seeking (i.e., higher psychological distress leading to lower help-seeking) for higher-compression rosters. This meant that employees on higher compression rosters were less likely to seek help when experiencing depression, anxiety and stress symptoms. In relation to the number of hours worked a day, the results highlighted the increased strength of the negative relationship between adjustment and psychological distress for employees who worked longer hours, meaning that those

who worked longer hours and experienced fewer adjustment issues were also more likely to experience higher psychological distress. The negative relationship between stigma and help-seeking was stronger for employees who worked fewer hours, so that those who worked longer hours were less likely to seek help due to the stigma associated with doing so.

6.9.3 Model Variance Explained by Individual and Employment Characteristics

In addition to testing the hypotheses, employment conditions and individual characteristics were also examined. The variables were mean-centred (Cohen et al., 2003) before running a series of process regression analyses (Hayes, 2013; Preacher & Kelley, 2011). The percentage of variance accounted for by individual characteristics (gender, age and education) and employment characteristics (commuting time and roster compressions) are shown in Table 6.24 below.

Table 6.24 *Percentage of Model Variance Explained by Individual and Employment Characteristics*

Outcome Variable	Predictor Variable	
	Individual characteristics %	Employment characteristics %
Mental health problems	1.6	4.7
Stigma	.04	1.8
Help-seeking	2.1	2.8

6.10 Empirical Model and Hypotheses Findings

Analysing the structural models led to a new understanding of how working conditions affected the mental health and related domains of Australian FIFO mining workers. For example, the findings showed that adjustment was negatively related to psychological distress and had a minimal effect on stigma. They also showed psychological distress and stigma were negatively

related to help-seeking. This inverse relationship between psychological distress and help-seeking was mediated by stigma, an important theoretical finding for illuminating the underlying internal processes. The conceptual model did not show an effect of adjustment on help-seeking. The relationships between adjustment and a linking of psychological distress and stigma with help seeking were statistically significant and were directly and indirectly (through moderation effects) influenced by job demands. The standardised regression coefficients (β) were entered into the empirical model (see Figure 6.10 illustrating the above relationships). In addition, Table 6.25 below displays the hypotheses tested by the research and the results.

The results of the hypotheses have implications for theory and research, prevention and early intervention programs. Primary contributions of this study are its robust empirical evidence of the extent of depression, anxiety and stress symptoms experienced by FIFO employees, and provision of a new theoretical model to explain mental health and related domains among the Western Australian FIFO mining workforce.

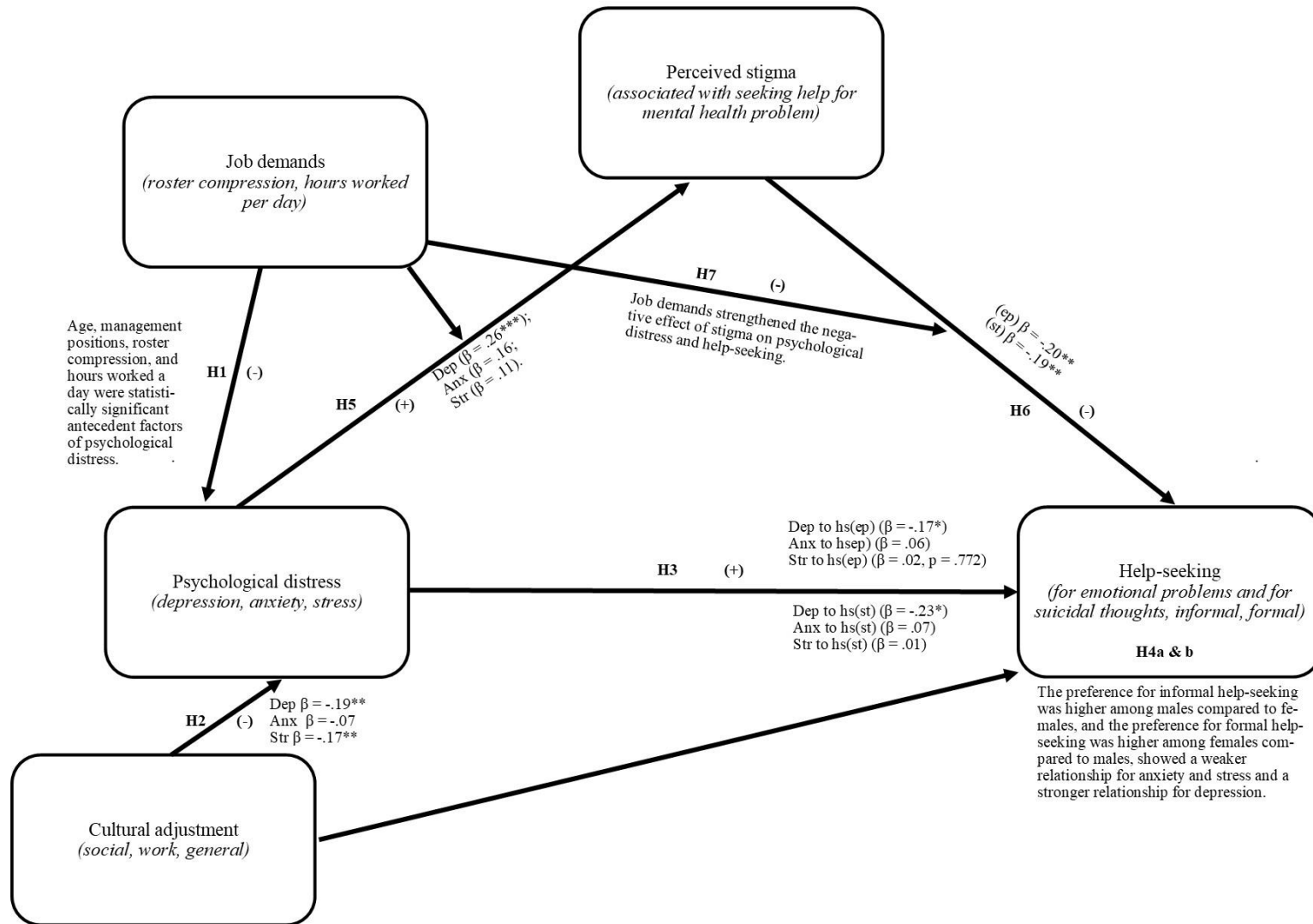


Figure 6.10 Empirical Model Findings

Table 6.25 *Results of Hypotheses*

Hypothesis	Outcome
<p>Hypothesis 1a: Depression, anxiety and stress symptoms are higher among employees on high compression rosters compared with those on lower compression rosters</p> <p>Hypothesis 1b: Depression, anxiety and stress symptoms are higher among employees who work longer days compared with those working shorter days</p>	<p>Hypothesis 1 was only partially supported with participants on roster compressions higher than 2.01 and those working more than 12 hours a day reporting higher depression, anxiety, and stress symptoms.</p>
<p>Hypothesis 2: Adjustment levels are higher among employees with lower depression, anxiety and stress symptoms compared to those with lower levels of adjustment.</p>	<p>The standardised regression coefficient of $-.16^{***}$ for Adjustment \rightarrow Psychological distress means that for one standard deviation decrease in Adjustment there is a .16 standard deviation increase in Psychological distress, a mild yet distinct effect. When mental disorders are separated, a stronger effect is observed for depression ($\beta = -.19^{***}$), followed by stress ($\beta = -.17^{***}$) and anxiety ($\beta = -.07$, $p = .077$). Subsequently, Hypothesis 2 was supported.</p>
<p>Hypothesis 3: Levels of help-seeking intentions for emotional problems will be higher among FIFO employees with lower levels of depression, anxiety and stress symptoms when compared with levels of help-seeking intentions for suicidal thoughts.</p>	<p>For emotional problems, the relationships between depression ($\beta = -.17$, $p = .016^*$) and help-seeking was weak and significant, while for anxiety $\beta = .06$, $p = .301$) and stress ($\beta = .02$, $p = .772$) they were mild to weak and not significant. For suicidal thoughts, the relationships between anxiety $\beta = .07$, $p = .233$), stress ($\beta = .01$, $p = .939$) and help-seeking were also weak and not significant. However, the relationship between depression ($\beta = -.23^*$) and help-seeking under the suicidal thoughts condition was significant. Hypothesis 3 was thus only partially supported.</p>
<p>Hypothesis 4a: The preference for informal help-seeking will be higher among males compared to females</p> <p>Hypothesis 4b: The preference for formal help-seeking will be higher among females compared to males</p>	<p>The results demonstrated that stigma levels varied depending on the type of psychological distress being experienced. Depression ($\beta = .26^{***}$) was linked to higher perceptions of stigma, while anxiety ($\beta = .16$, $p = .006$) and stress ($\beta = .11$, $p = .102$) had little effect. Hypothesis 4 was therefore supported.</p>

Hypothesis	Outcome
Hypothesis 5: Higher levels of stigma will be perceived among FIFO employees with higher levels of depression, anxiety and stress symptoms compared to those with lower symptoms.	Results indicated that stigma mediated the relationship between psychological distress and help-seeking for both emotional problems and suicidal thoughts, in support of Hypothesis 5.
Hypothesis 6: Higher perceptions of stigma will mediate the negative effect of psychological distress and help-seeking	The results demonstrated that significant differences existed between genders for the relationship between mental health problems and informal support; however, there were no significant differences in the relationship between mental health problems and formal support. Therefore, Hypothesis 6(a) was supported, while Hypothesis 6(b) was not.
Hypothesis 7a: Higher roster compression will strengthen the negative effect of stigma on psychological distress and help-seeking. Hypothesis 7b: Longer working hours a day will strengthen the negative effect of stigma on psychological distress and help-seeking.	The working conditions of higher-compression rosters and longer working hours a day influenced the strength of the mediation in the empirical model. Therefore, Hypotheses 7(a) and 7(b) were both supported

6.11 Conclusion

Following missing-case analysis and data preparation, descriptive statistical analysis was used to gauge the prevalence of specific mental health dimensions among FIFO mining employees. The results indicated elevated levels of depression, anxiety and stress among this cohort and variations aligned with certain demographic characteristics. Help-seeking behaviour was explored, and differences observed between employees who experienced emotional problems and suicidal thoughts. This chapter reported on the prevalence rates of depression (28.3 per cent), anxiety (22.3 per cent) and stress (19.4 per cent) among FIFO mining workers. Hypothesis 1 was partially supported by the findings that indicated FIFO employees on higher roster compressions and those working longer days experienced higher depression, anxiety and stress symptoms. Both measurement and structural models were subjected to SEM analysis.

The first model tested the relationships between adjustment, psychological distress (depression, anxiety and stress), stigma and help-seeking. Psychological distress was then collapsed into a second model, to examine the interrelationships between adjustment, depression, anxiety and stress, and their relationship to stigma and help-seeking. Hypothesis 2 was supported by the results, indicating FIFO employees' adjustment was negatively related to depression, anxiety and stress symptoms. Those who reported lower adjustment rates also reported higher symptoms of depression, anxiety and stress. Hypothesis 3 was partially supported by the results, showing the strength of the relationships between FIFO employees' depression, anxiety, stress symptoms and help-seeking intention differed for emotional problems and suicidal thoughts, with a weaker relationship to emotional problems and a stronger relationship to suicidal thoughts. Hypothesis 4 also supported differing relationships between FIFO employees' depression, anxiety, stress symptoms and perceptions of stigma for various mental disorders; the relationship weaker with anxiety and stress, and stronger with depression.

Hypothesis 5 confirmed that stigma mediated the negative effects of psychological distress and help-seeking. Differences also surfaced between genders in relation to preferences for informal help-seeking, thus supporting Hypothesis 6a. Hypothesis 6b, however, was not supported, as there were no identified differences between genders in relation to preferences for formal help-seeking. Hypotheses 7a (roster compression) and 7b (length of working hours) were both supported by the findings, showing these two working conditions strengthened the negative effect of stigma on psychological distress and help-seeking.

In sum, the major findings of the study were:

- FIFO mining workers experience higher levels of depression, anxiety and stress than the general working population;
- Help-seeking preferences differ according to the type of problem experienced by workers. Friends, parents and intimate partners are preferred sources of help for the emotional problem condition; however, a strong preference for not seeking help from anyone also emerged. For the suicidal thoughts condition, help was predominantly sought from a doctor, friend or mental health professional. While a strong preference for not seeking help from anyone was also evident amongst this sample, the effect was reduced;
- FIFO working conditions are structural barriers to employees accessing support;
- High compression rosters and long working hours exacerbate the reluctance of FIFO mining workers to access support;
- An inverse relationship was found between psychological distress and help-seeking behaviour.

The final chapter will further discuss these findings.

Chapter 7 - Discussion and Conclusions

7.1 Introduction

FIFO working arrangements in the Australian mining industry have raised questions about the impacts on employees' mental strain ([Bowers et al., 2018](#)). To compound the situation, previous research has shown that FIFO mining workers often do not access the support that could help them ([Henry et al., 2013](#); [Torkington et al., 2011](#)), partly attributed to their perceived stigma associated with seeking such assistance. The mental health of FIFO employees has become an important Australian public policy issue, as evidenced by the Western Australian State Inquiry ([WA Education and Health Standing Committee \(final report\), 2015](#)), and numerous research agendas have attempted to enhance our understanding of the mental health issues encountered by this employment group. In addition, the need for studies with sufficient sample sizes has long been acknowledged, and for these reasons, the current research employed a sufficiently large sample size for in order to provide new insights on the psychological distress and help-seeking intentions of FIFO mining workers.

The results reported in the previous chapter are further elaborated below to address the three research questions posed in this thesis. First, an outline is presented of mental health prevalence rates among the subjects of this study, linking the findings to previous research on FIFO employees in the Australian mining industry. The results of the SEM models, identifying associations between the dimensions of mental health are discussed next, followed by the influence of FIFO working conditions on these dimensions and the relationships between them. The theoretical contributions of the research are reviewed, drawn from the Theory of Planned Behaviour, the Process Theory of Help-seeking and the Job Demands-Resources/Psychosocial Safety Climate framework, before the chapter concludes with the implications and limitations of the study, as well as suggestions for future research and theory development.

7.2 Mental Health Prevalence

Linked to the first research question, the mental health prevalence of the sample is further discussed in the next sub-section. An important finding was elevated depression, anxiety and stress levels associated with FIFO mining employment conditions and individual differences.

7.2.1 Depression, Anxiety and Stress Rates

Anecdotal reports of elevated mental disorders and suicide rates among FIFO employees in the Australian mining industry ([for example, see Stünzner, 2018](#)) sounded some “alarm bells” concerning the mental health of these workers. The lack of available empirical evidence on the psychological health of FIFO employees has also been a cause for concern in academic circles (e.g., [Henry et al., 2013](#); [Velandar et al., 2010](#)) and the public policy arena (e.g., [House of Representatives, 2013](#)). An objective of this thesis was, therefore, to establish the prevalence of depression, anxiety and stress among a large sample of FIFO employees and examine the underlying causes. Various Australian parliamentary inquiries identified this as a high-priority issue, partly due to the dearth of available research on the issue ([WA Education and Health Standing Committee \(final report\), 2015](#)). To further compound the situation, high rates of mental disorders have been identified in previous studies. The current research confirmed higher rates of mental disorders among FIFO workers than in the general Australian population, broadly consistent with previously published research by [Bowers et al. \(2018\)](#), [Henry et al. \(2013\)](#) and [Velandar et al. \(2010\)](#). Compared to the 13% of the Australian general population, 28.3% of participants scored at or above the Moderate clinical cut-off category for depression, 22.3% for anxiety and 19.4% for stress.

7.2.2 Employment Conditions

The research found that FIFO employment conditions were associated with psychological distress, consistent with previous empirical studies (Henry et al., 2013; Peetz et al., 2012). There is little empirical research regarding the effects of FIFO related job demands on psychological wellbeing, partly because the FIFO working model has recently become enshrined in the mining industry practice. Thus, only a few studies have shed light on how the various strains of FIFO employment may affect mental health (Bowers et al., 2018). The current study identified significant results, supporting the idea that FIFO are at elevated risk of experiencing depression, anxiety and stress that is linked to their employment context. This is also consistent with the findings of [Henry et al., \(2013\)](#), [Bowers et al., \(2018\)](#), [Miller \(2014\)](#) and [Velandar \(2010\)](#).

Different working conditions related to depression, anxiety and stress. There were no statistically significant differences for the FIFO commute time or remuneration. Depression and anxiety symptoms were identified to be higher among non-managers compared to managers, and this may be linked to other job related conditions such as high levels of job control among managers. Depression, anxiety and stress symptoms were at their peak among higher-compression

rosters compared to medium- and low-compression rosters. This finding is followed by another that showed anxiety and stress symptoms were statistically higher among workers on longer hours compared to medium and shorter hours. The results indicated that FIFO working conditions exacerbated the stressor-stress-strain relationship. Thus, individuals employed under these working conditions may become more vulnerable to psychological distress than their urban based counterparts. This finding is central to understanding how to combat mental health problems in the mining industry among FIFO workers.

While these findings are consistent with [Henry et al. \(2013\)](#), it does contradict the findings of [Clifford \(2010\)](#), whose study showed normal-range depression and anxiety levels among FIFO employees and peak stress levels during the work-to-leave transition period. Roster compression was also found to moderate the inverse relationship between psychological distress and help-seeking, whereby reluctance to seek support increased in parallel with higher-compression rosters, likely due to both attitudinal barriers (stigma) and structural barriers (little time to access support services). FIFO employees who worked longer hours per day reported statistically higher anxiety and stress symptoms, although there were no differences in their symptom levels for depression. This finding is consistent with an earlier FIFO psychological health study that identified higher rates of psychological distress was correlated with longer working hours ([Peetz et al., 2012](#)).

7.2.3 Individual Differences

The impact of individual differences and employment conditions on depression, anxiety and stress were examined for a deeper understanding of the antecedent factors contributing to psychological distress in the context of the FIFO mining industry. Notably, working conditions (job demands) predicted psychological distress, in accordance with the JD-R ([Demerouti et al., 2001](#)) and PSC ([Dollard & Bakker, 2010](#); [Dollard & Karasek, 2010](#)) models. [Barclay et al. \(2013\)](#)'s study indicated that occupational status (i.e., professionals/ managers compared to non-professionals/non-managers) also had a significant effect on psychological distress. Two particular antecedent job demands, identified in prior FIFO psychological health studies, viz., roster compression ([Clifford, 2010](#); [Henry et al., 2013](#)) and hours worked each day ([Peetz et al., 2012](#)), were found to impact FIFO employees' psychological distress, consistent with previous research on the Australian FIFO mining workforce (see [Bowers et al., 2018](#); [Clifford, 2010](#); [Henry et al., 2013](#); [Peetz et al., 2012](#)).

In terms of age, younger FIFO employees (between 18 and 33 years old) reported significantly higher levels of depression, anxiety and stress compared to older workers, which may

be partly due to the lower numbers of managers and professionals in this younger age group. However, there may be other reasons for this, such as younger employees in predominantly subordinate positions and their associated work conditions having less experience in the labour market or having different job/work expectations than older workers. Since marital status and living with children were not significant, other factors may be at play. Participants in non-management positions reported statistically higher depression and anxiety symptoms compared to managers, however, there were no differences between the stress levels of managers and non-managers. This is a valuable finding in the light of [Barclay et al.'s \(2013\)](#) study, with a gender distribution of 58 per cent male and 42 per cent female, compared with other FIFO psychological health studies that reported approximately an 81-86 per cent of male FIFO employees (e.g., [Henry et al., 2013](#); [Velandar et al., 2010](#)). In addition, their sample comprised mainly managers and professionals, of whom almost 70 per cent held a university degree, whereas in other FIFO research, managers and professionals comprised only about one-quarter of the sample ([Henry et al., 2013](#)). It may well be that employees in management positions are exposed to different job demands (stressors) that, in turn, are associated with different levels of psychological strain. For instance, professionals/managers may have greater job control or work in more comfortable conditions (e.g., air-conditioned offices compared to truck driving in difficult terrain) than non-professionals/non-managers. It is also possible that the lower rates of depression and anxiety evidenced amongst managers/professionals relate to individual differences (e.g., socio-economic and/or educational opportunities).

In this study, FIFO managers reported higher levels of adjustment compared to non-managers. This finding may partly explain the differences in psychological distress between these groups, given the premise of this thesis that those who adjust better to FIFO working arrangements experience better mental health. The significantly lower depression and anxiety symptoms of FIFO managers compared to non-managers is theoretically relevant, because it allows for a more nuanced understanding of individual and occupational differences and their influences on mental health. In addition, non-manager participants were less likely to seek help and more likely to experience heightened perceptions of stigma during episodes of depression, anxiety and stress than managers.

The predominantly male sample in this PhD study is consistent with prior research (e.g., [Henry et al., 2013](#); [Velandar et al., 2010](#)) and wider census data (Australian Bureau of Statistics, July, 2013). Although a number of mental disorders, such as schizophrenia, and suicide occur more frequently among men than women (see [Ferrari et al., 2014](#); [Takeuchi, 2010](#)), depression, anxiety

and stress are generally understood to be relatively evenly spread among genders in the Australian population ([Australian Bureau of Statistics, 2016e](#)). Consistent with Henry et al. (2013), the results of this study indicated few differences in depression, anxiety and stress symptoms between males and females.

7.3 Associations between Mental Health Dimensions

Linked to the second research question, the associations between different mental health dimensions are discussed in the next sub-sections, including barriers to employee help-seeking imposed by adjustment and stigma, as well as gender effects.

7.3.1 Adjustment

The research identified a significant connection between adjustment and psychological distress, indicating that employees who struggled to adapt to the FIFO lifestyle encountered more mental health problems. This finding supports the research of [Casey \(2009\)](#); [Casey and Bailey \(2011\)](#) that showed adjustment difficulties were triggered by stress. The results also reinforce the research of [Clark and Watson \(1991\)](#), identifying depression and anxiety as closely related yet separate constructs frequently occurring together. This study showed a negative relationship between adjustment and both depression and stress symptoms, but not between adjustment and anxiety, consistent with Takeuchi et al. (2005), who found low levels of employee adjustment affected both the psychological strain and job performance of workers. The implications are that FIFO employees will increasingly develop negative treatment beliefs, experience more barriers to care and continue to hide their emotions, resulting in poor adjustment to the FIFO workplace culture, as potentially similar to research on military personnel (Fertout et al., 2015; Zinzow et al., 2012). In such a scenario, the outlook appears rather bleak for the adjustment of FIFO employees to their working arrangements (i.e., work and living conditions), as it is a well-established risk factor for depression and stress symptoms. The importance of this finding is in establishing a focus on supporting workers' adjustment which may be expected to have positive flow-on effects on psychological wellbeing.

7.3.2 Stigma as a Barrier to Help-Seeking

The research also found stigma mediates the relationship with help-seeking for both emotional problems and suicidal thoughts. FIFO mining workers with higher perceived stigma were less likely to access informal support (e.g., friends, family members) or formal support services (e.g., counsellors, doctors), consistent with previous empirical studies that found stigma a strong predictor of formal help-seeking (Lannin et al., 2015; Vogel et al., 2006; Vogel et al., 2007; [Milne et al., 2018](#)). Little is known about the relationship between stigma and informal support preferences because most of the help-seeking literature has investigated formal help-seeking, and as a result, there is a dearth of information about the effect of stigma on informal help-seeking (Rickwood & Thomas, 2012). The current study identified a significant association between stigma and decreased help-seeking through either formal or informal avenues for mental disorders, supporting the conclusion that FIFO employees avoid seeking help due to a perceived fear of how others might view them. This is also consistent with the findings of [Torkington et al. \(2011\)](#).

Different mental health conditions were found to relate to differing levels of stigma, with depression exhibiting the strongest effect, followed by stress and anxiety respectively. The findings also reflect the conclusions of prior studies (i.e., Lannin et al., 2015; Vogel et al., 2009) and indicate that FIFO employees who suffer from depression experience stigma as a substantial barrier to seeking help. The results also imply that FIFO workers with high stress and/or anxiety are more likely to seek help than their depressed counterparts. Separating mental health conditions to show how specific conditions (in this case, depression) can render individuals more vulnerable to stigma than those who experience stress or anxiety was a unique contribution of this study.

Another important research finding was the significant barrier imposed by stigma on help seeking. The notion that individuals who experience more severe psychological distress are also more deterred by stigma to seek help is a major concern, because it indicates that those who most require support and assistance experience the greatest barriers. Given individuals' social networks and co-workers impact on their perceptions of stigma (Vogel et al., 2009) and that FIFO mining employees live and work together for extended periods of time, it is highly likely that the FIFO environment intensifies feelings of stigma. The participants in this study who reported high levels of mental health problems were also more likely to experience stigma, and as a result, less likely to seek help. This effect was stronger for the condition of suicidal thoughts than emotional problems.

7.3.3 Gender Effects

The extant literature widely reports that women utilise formal supports far more frequently than men (e.g., Rickwood & Thomas, 2012; Wilson et al., 2005). However, there is limited research on gender differences for informal help-seeking preferences and how stigma might impact those relationships. Lannin et al. (2015) found that gender did not impact the relationships between psychological distress, stigma and formal help-seeking, which the current study confirmed in the predominantly male FIFO workforce. It may be the case that elements of the FIFO mining workplace culture exacerbate stigma for males but not for females. It is also possible that underlying attitudes toward informal help-seeking differ between males and females. The indication that both male and female FIFO workers who experienced stigma were less likely to prefer formal supports is an important finding and suggests more can be done to build and develop informal support networks for mining employees (e.g., mentoring and peer support programs).

One advantage of informal support is that it can utilise the existing mining workforce and costs relatively little compared to formal supports. Formal support options are provided by organisations for professional treatment of suicidal thoughts and more severe levels of psychological distress. The findings highlighted the need for supports to be tailored to the help-seeking preferences of the workforce, as this would be expected to improve cost effectiveness. The FIFO mining employees in this study reported a general reluctance to seek support from a recognised religious leader or authority and preferred engaging with a medical doctor. It may be that FIFO workers anticipate criticism of suicide from a religious leader because it is considered a “sin” in a number of religious faiths. Medical practitioners may be viewed as more neutral, and under the Hippocratic Oath, obligated to provide a professional mental health assessment without perceived judgement. However, since preferred sources of support depend on several factors, such as culture, religion and the type of problem experienced, a range of supports, including a combination of formal and informal resources, are recommended to cater for diverse presentations of mental ill health in the FIFO mining workforce for both men and women.

7.4 Influence of FIFO Working Conditions

The influence of working conditions on the sample is discussed next to help address the third research question. Previous research established that job demands exert an influence on the mediating effects of internal processes ([Ng et al., 2008](#)). For instance, in the study of [Ng et al. \(2008\)](#), reviewed in Chapter 3, the perceived capabilities of leaders to perform their roles were shown to mediate the relationships between personality traits (extraversion, neuroticism and

conscientiousness) and leader effectiveness. Moderated mediation analysis further identified that this only mediated the relationships between the three personality types for leaders with low job demands, demonstrating that the strength of the relationships between internal processes may differ between employees, depending on job contexts and demands. It was therefore important to understand how job demands moderated the mediated internal processes ([Ng et al., 2008](#)) (such as the mediation of stigma on the mental health/help-seeking relationship), and to evaluate the strength of these relationships between employees in different job contexts.

The heightened psychological distress and stigma experienced by individuals on higher-compression rosters and longer working hours was also a significant finding in this study. As outlined in Chapter 3, the Job Demands-Resources model identified that job demands intensified employee mental strain, consistent with other empirical research ([Demerouti et al., 2009](#); [Hall et al., 2013](#)). There was substantial evidence in this study to verify that high-compression rosters and long working hours exacerbated psychological distress for FIFO mining employees. Furthermore, as their psychological distress intensified, their perceptions of stigma increased and their tendency to seek help decreased (for example, telephoning a helpline or talking to a work colleague). In this research, the inverse relationship between psychological distress and help-seeking (i.e., higher psychological distress symptoms resulting in lower help-seeking) was commensurately enhanced for employees on increasingly high-compression rosters, with the result that they were less likely to seek help. There was a significant difference between participants on medium- and high-compression rosters in the pathway between adjustment and psychological distress, with a strong negative relationship for those on medium-compression rosters. This implies that mining employees on higher-compression rosters experienced more difficulties adjusting to FIFO working arrangements than those with more non-working time.

The number of hours worked per day has been widely linked to psychological distress and the research indicates that long working hours for any employee, regardless of setting, may exacerbate distress. FIFO mining employees, who work an average of 12 hours a day and frequently more, are therefore likely to be susceptible to psychological distress. The FIFO mining workforce typically works substantially longer hours than the Australian norm, with 54 per cent working more than 60 hours a week (Australian Bureau of Statistics, March, 2016a). Further analysis of working hours revealed that the negative relationship between adjustment and psychological distress was more acute among participants who worked longer hours, indicating that employees who adjusted more easily to their circumstances also experienced lower psychological distress symptoms. The Process Theory of Help-seeking was used to frame the

various barriers to seeking support for psychological distress. SEM analysis found a significant difference between participants who worked fewer than 12 hours a day and those who worked more than 12 hours a day in the pathway between stigma and help-seeking. In the same pathway, a significant difference was also observed among FIFO participants who worked 12 hours and those who worked more than 12 hours a day. Accordingly, the negative relationship between stigma and help-seeking was stronger among participants who worked fewer hours, implying that employees who worked longer hours were less likely to seek help due to stigma associated with doing so. These findings indicate that individuals who worked longer hours experienced additional barriers to accessing support and requisite care (Britt et al., 2008). Quite simply, it appears that high-compression rosters can make it difficult for employees to access support due to time and distance constraints in remote locations.

7.5 Theoretical Implications

Together with the empirical findings, the development of the moderated mediation model of Mental Health and Help-Seeking created a broader framework for advancing our understanding of the Theory of Planned Behaviour (TPB) and the Process Theory of Help-seeking along with the extended Jobs Demands-Resources model. The contributions of this research are discussed in the following sections, including the empirical model and the Process Theory of Help-Seeking, the JD-R model and the mediating role of stigma on help-seeking.

7.5.1 Contribution of Models

The results of the moderated mediation underscored the importance of including working conditions when examining the links between adjustment, mental health problems, stigma and help-seeking. The current study provides a new empirical model, not only applicable to FIFO employees in the Australian mining industry, but also more broadly to other employment contexts. For instance, the model could be relevant to any male-dominated workforce, particularly those characterised by 12-hour working days, such as fire and emergency response teams and some elements of the armed forces. In such contexts, the model can identify workers at risk of psychosocial injury based on factors such as age, occupation, role and working hours for early intervention on an individual level and increased productivity on an organisational or macro level, as noted by Dollard ([2012](#)) and her colleagues.

The effects of adjustment on employee psychological wellbeing is not well understood. By demonstrating how adjustment affects depression, anxiety and stress symptoms, the current study has contributed empirical information to this line of inquiry. The results imply that interventions for psychological distress can be materialised by an organisational focus on improving employees' adjustment experiences. The differences between stigma levels and various mental disorders deepened our understanding of socially sanctioned supports. Given that stress was identified as less stigmatised than depression and anxiety, there is an advantage for organisations to adopt stress-reduction strategies for dealing with a wider range of mental health disorders. The changes observed in the strength of the relationships between depression, anxiety, stress symptoms and help-seeking intentions, depending on the problem experienced and preferred sources of support, have significant implications for intervention programs. It is recommended that mining industry organisations introduce stigma-reduction training for FIFO workers, either at induction or pre-employment stage, as an effective way of decreasing the potential and severity of depression and anxiety. Finally, exploring the mediating effects of stigma on psychological distress and help-seeking for emotional problems and suicidal thoughts has provided valuable information about the underlying help-negation effect.

The new information garnered on the influence of FIFO roster compressions and the number of hours worked a day on depression, anxiety and stress symptoms points towards two areas of prevention. [Miller \(2014\)](#) concluded there is little difference in terms of FIFO employees' mental health when compared with residential mining employees, indicating that, aside from commuting and time away from home there may be certain job demands common to both groups (FIFO and residential mining employees) that are inclined to exacerbate mental disorders. Of the two job demands tested in that study, roster compression related only to FIFO mining employees, while the number of working hours a day related to both FIFO and residential mining employees. The influence of job demands on the relationships between adjustment, mental health, stigma and help-seeking are beneficial for making FIFO mining companies/employers aware of the potential benefits and stigma-reduction training. Targeted at employees on high-compression rosters and working 12 hours or more a day, this could significantly reduce and even prevent psychological distress in their workforces. The impact of job demands on the relationships between psychological distress, stigma and help-seeking requires further scrutiny in the context of other job demands, such as shift work, workplace bullying and difficulties communicating with friends and family to better inform organisational PSC decision making.

7.5.2 Theory of Planned Behaviour and Process Theory of Help-Seeking

The study employed the Theory of Planned Behaviour (TPB) ([Ajzen, 2011](#)) and the Process Theory of Help-Seeking ([Rickwood et al., 2005](#)) to examine the mental health and help-seeking practices of the Western Australian FIFO mining workforce. As each theory possesses unique weaknesses, they were integrated to strengthen the overall theoretical approach. Both theories clarified understanding of the inter-relationships between the variables to answer the research questions. The organisational perspective was included through the use of the Jobs Demands-Resources (JD-R) model. The processes involved in FIFO employees becoming aware of depression, anxiety and stress symptoms and engaging with supports were clarified using TPB and the Process Theory of Help-Seeking, and the effects of working conditions on both psychological wellbeing and help-seeking were further understood through JDR.

The results were consistent with prior research that found individuals must become aware of their symptoms and need for support ([Rickwood & Thomas, 2012](#); [Wilson et al., 2005](#)) before taking action. The FIFO mining workforce has been known to engage in avoidance coping strategies and blocking out symptoms of mental health problems ([Henry et al., 2013](#); [Keown, 2005](#); [Velandar et al., 2010](#)). An important advantage of TPB is the claim that an individual's psychological state can reduce their awareness of their own current mental state, in turn impairing an individual's cognitive awareness that they may need help ([Saunders & Bowersox, 2007](#); [Wilson & Deane, 2010b](#)). The Theory of Planned Behaviour assisted in refining a model that could be used to explain differences in this aspect of help-seeking. In addition, TPB highlighted the role of subjective norms, possibly adopted during FIFO employees' cultural adjustment and/or due to the mediating construct of intentions (affected by stigma). These are useful additions to the complex interacting variables that influence help-seeking behaviours.

7.5.3 Job Demands-Resources Model

The research contributes to the literature by developing a model to provide a new framework for integrating adjustment, psychological distress, stigma, help-seeking and job demands. This helps to further sharpen our understanding of employees' experiences of FIFO employment. The study highlighted the moderating influence of two contextual job demands (roster compression and long working hours) on the relationships between adjustment, psychological distress, stigma and help-seeking, and therefore extended our applied knowledge of JD-R.

7.5.4 The Mediating Role of Stigma on Help-seeking

The study demonstrated the key influence of stigma on help-seeking behaviour, suggesting that cognitive processes are important mediators of individuals' behavioural intentions. Since stigma is a key barrier to seeking help (see [Jennings et al., 2015](#); [Lannin et al., 2015](#); [Wade et al., 2015](#)), the Process Theory of Help-Seeking was employed to clarify how FIFO mining workers are prevented from accessing supports. The majority of existing social-cognitive help-seeking models are weakened by the supposition that decision-making with regard to seeking help is a rational process which directly determines an individual's behaviour (Wills & Gibbons, 2009; Wilson & Deane, 2010b). Although the link between cognition (thinking) and affect (feeling) is firmly established in the literature ([Mears, Watson, & Shirreffs](#)), few help-seeking models acknowledge the influence of individuals' affective states on their cognitive responses to the affective state. Rickwood and Thomas (and others) argued that in order to seek help, individuals must first identify their symptoms and need for help (see Rickwood et al., 2005; Rickwood & Thomas, 2012). However, emerging research has shown that increased psychological distress can inhibit individuals' awareness of their own symptoms. The response of individuals to their symptoms of psychological distress can therefore be viewed as a reflection of the underlying causes for the gap between mental health needs and service use ([Rickwood et al., 2005](#); [Wilson & Deane, 2010a](#)). Prior research has reported an inverse relationship between mental distress and help-seeking behaviour, termed the "help negation" effect (Wilson & Deane, 2010b). This is a problematic situation because it implies that employees who are more unwell are less likely to access support. The current study also indicated that the help-negation effect was exacerbated by stigma, furthering our understanding of this effect on the FIFO mining workforce.

Mediation analysis determined that stigma significantly mediates the inverse relationship between psychological distress and help-seeking. The moderated mediation analysis showed this relationship was exacerbated by higher job demands and supported the notion that FIFO mining workers who experience suicidal thoughts and depressive symptoms avoid reaching out, consistent with prior research in the general population ([Wilson & Deane, 2010a](#)). Decision-making with regard to help-seeking can be impeded by emotional states (i.e., depression). As symptoms increase, FIFO mining workers' intentions to seek help decrease by a mildly strong, but substantial degree, suggesting a significant difference between those experiencing depressive symptoms compared to those having suicidal thoughts at the decision-making stage for help-seeking. These findings are consistent with [Wilson and Deane \(2010a\)](#) who similarly identified higher levels of depressive symptoms strengthened the help-negating effects of suicidal thinking for seeking help

from friends, family, and in some cases, no-one. The results imply that experiencing suicidal thoughts actually increases difficulties with decisions to access support, arguably at a time when the FIFO mining employee is most vulnerable and in need of help.

7.6 Practical Implications

7.6.1 Implications for the Mining Industry

The findings of this thesis provoke numerous suggestions and implications for practice, including extending workplace health and safety (WHS) approaches to address mental health; improving FIFO workers' adjustment experiences; increasing help-seeking behaviour; reducing stigma; and improving working conditions.

Extending the WHS approach to address the mental health of FIFO employees is a key recommendation of this thesis. Psychological distress has been increasingly recognised for its negative impacts on organisational outcomes (e.g., worker productivity, absenteeism, intentions to quit) ([Bailey, Dollard, & Richards, 2015](#); [McTernan et al., 2013](#)), yet, as pointed out in Chapter 1, psychosocial risks and safety have lagged behind physical health and safety in regard to both current information and organisational action. In light of the study findings, it is strongly recommended that current, established work health and safety (WHS) policies and practices be adapted by the mining industry to better address psychosocial risks. For example, the Australian Government Department, Safe Work Australia organisation, promotes four steps for managing WHS risks: (i) Identifying hazards (finding out what could cause harm); (ii) Assessing risks (understanding the nature of the harm that could be caused by the hazard, how serious that harm could be and the likelihood of it happening); (iii) Controlling risks (implementing the most effective control measure that is reasonably practicable in the circumstances); and (iv) Reviewing control measures (ensuring that control measures are working as intended) ([Safe Work Australia, 2018](#)).

Risk management is currently managed in the Australian mining industry by virtue of compliance with the model WHS Regulations, detailed requirements that were designed to support the duties outlined in the model WHS Act 2011. The model WHS Regulations require mining companies to work through a Hierarchy of Risk Control when managing health and safety risks; this comprises three steps: Level 1 – eliminating hazards wherever possible; Level 2 – substituting and isolating the hazard; and Level 3 – reducing exposure to the hazard using administrative

actions. Due to its benefits, the Hierarchy of Risk Control is promoted by the WA Department of Mines, Industry Regulation and Safety ([WA Department of Mines, 2018](#)), including:

- Company staff are already familiar with the processes, so could conceivably apply the model to addressing psychosocial hazards;
- There is an existing culture of compliance for workplace WHS requirements; and
- There are existing requirements to support these WHS processes in the model WHS Act.

The importance of primary interventions (e.g. administrative/organisational factors; support for adjustment) are anticipated to be key in administering behavioural change programs among FIFO workers. Extending WHS to manage psychosocial hazards and risk management is a logical step that builds on existing compliance procedures within mining companies. This could be achieved through developing a strong psychosocial safety climate within organisations. This in turn may result in better working conditions and reduced job demands among FIFO workers, and will subsequently result in improvements to individual and organisational wellbeing. Policies, practices and procedures associated with protecting FIFO mining employee mental health need to be developed, since organisations have a duty of care to protect and promote the wellbeing of their workforces. It is highly recommended that strategies be implemented to positively influence the workplace culture with regard to mental health and stigma around seeking help. For example, strategies focusing on job design and cultural change can be aimed at eliminating mental health hazards (Level 1); leadership development for mental health care and a workplace behaviour policy can substitute and isolate mental health hazards (Level 2), and establishing appropriate reporting procedures for mental health can be integrated as a component of administrative actions (Level 3) ([WA Department of Mines, 2018](#)).

Mining companies could also promote organisational change focused on preventing and reducing job stress ([Bailey, Dollard, & Richards, 2015](#); [McTernan et al., 2016b](#)). Some authors (e.g., [Vojnovic, 2016](#)) cited risk assessment analysis, regular inspections by professionals and mandatory health check-ups to assess substance misuse and psychological distress symptoms (see also, [Takeuchi, 2010](#)) as possible organisational strategies for reducing the risk of psychosocial injury. Since substance misuse has been linked to psychological distress and work-related suicide ([Ferrari et al., 2014](#); [World Health Organisation, 2012](#)), restricting alcohol consumption in FIFO mining accommodation is one obvious response, and many companies have already taken positive steps in this direction ([Harvey, 2013](#)). However, care must be taken to balance such actions with the personal freedom of employees.

The likelihood of higher turnover rates in the Australian FIFO mining workforce as a consequence of mental health issues has significant economic and HRM implications. Destigmatising mental health problems and help-seeking, increasing mental health literacy and early detection of psychological distress should be on the radar of every Human Resource Management (HRM) department in all mining firms. Management and support of employees who experience a mental health crisis and ensuring the necessary follow-ups occur will motivate and promote best practice ([Reavley et al., 2012](#)). By increasing access for employees to formal counselling services and telephone helplines ([WA Education and Health Standing Committee \(final report\), 2015](#)), available supports and resources can therefore be extended.

The current empirical findings showed that improved working conditions can fortify the mental health of FIFO employees. According to the findings of this thesis, compressed roster schedules, previously identified by the [WA Education and Health Standing Committee \(final report\) \(2015\)](#) and [Henry et al. \(2013\)](#) intensified the psychological distress of FIFO employees. Regulating roster compression represents an effective mitigation strategy under the WA Education and Health Standing Committee's Code of Conduct, in addition to managing psychosocial hazards by the Department of Mines, Industry Regulation and Safety. The issue of long working hours in the mining industry, previously reported by ([Peetz et al., 2012](#)), was also confirmed in this study. Adjusting rosters and working hours to better accommodate the needs of workers will likely reduce occupational stress and risks.

Increased help-seeking behaviour and reduced stigma should form the overarching objective of all key stakeholders, such as the WA Department of Mines, Industry Regulation and Safety, the Chamber of Minerals and Energy, and individual mining companies. This study has the potential to advance this agenda, taking into account FIFO employees' help-seeking preferences and how perceived stigma creates a significant, and at times, insurmountable barrier to seeking help. Although Employee Assistance Programs (EAPs) are widely available in the WA mining industry they are largely underutilised, most likely due to the stigma around help-seeking, low awareness of services and possible fear of job loss ([Henry et al., 2013](#)). Other barriers include scepticism or dislike of counselling services, time constraints and a prevailing belief that seeking help is somehow "unmanly" ([Henry et al., 2013, p. 87](#)). Past research highlighted the reluctance of men to engage with formal support services due to concerns about masculinity, self-reliance, stoicism and stigma ([Henry et al., 2013](#); [Pini & Mayes, 2012](#)). In view of this, supports that are better suited to men's help-seeking styles are arguably essential. Active community initiatives and campaigns that promote mental health to reduce the stigma of mental ill health (e.g., Movember,

R U Okay?) and promoting access to formal and informal supports are also recommended. Informal peer support programs have successfully been implemented in the Queensland construction industry to reduce high suicide rates ([Suicide Prevention Australia, 2014](#)), with the benefit of using the existing workforce to promote personal and interpersonal responsibility for mental health.

7.7 Limitations of the Study

There are some limitations associated with this study. First, the sample comprised FIFO employees in the Western Australian mining industry, mostly males in labouring and trade roles, and working in one state only (WA). FIFO mining employees may have responded to the survey differently than employees in other occupations (i.e., non-FIFO construction or engineering workers). However, this limitation could also be viewed as a strength, such that the research was a contemporary test of the effects of adjustment, psychological distress and stigma on help-seeking using a more exposed-to-risk sample. A further possible limitation is that participants self-selected their position, i.e., management or non-management. This potentially allowed for self-selection bias among the sample, since those in any supervisory position (e.g., lead hand in a labouring team) may have considered themselves managers.

Longitudinal data may provide more information about the duration of symptoms, while qualitative data could further illuminate the lived experiences of FIFO mining employees. Cross-sectional studies like this one assist in determining prevalence rates with the advantage of being relatively time effective, but there is a disadvantage of not allowing for a distinction between cause and effect. Since this thesis collected cross-sectional data, any conclusions about causality cannot be confirmed, and as a result, the significantly higher rates of depression, anxiety and stress in the sample compared with the general population may be attributable to other factors, such as working conditions underground rather than FIFO working conditions. The self-reporting measures used have been criticised for concerns about common method variance ([Podsakoff et al., 2003](#)). However, other researchers, such as [Spector \(2006\)](#), contend that common method variance does not significantly inflate correlations. In addition, the constructs of interest were focused on individual subjective perceptions, captured from self-reporting measures. It was hoped that including additional mental disorders (e.g., psychotic disorders, substance abuse) would facilitate further insights into the broader mental health experiences of FIFO mining employees.

7.8 Future Research and Theoretical Recommendations

7.8.1 Future Research

Assessments of psychological problems and self-reported assessments of mental disorder symptoms have been criticised in prior research for being susceptible to faked effects and social desirability ([Podsakoff & Organ, 1986](#)). Accordingly, the availability of employee clinical records will provide access to more objective measures of mental disorders and help-seeking for future studies. Broad-ranging mental disorders, such as schizophrenia and bi-polar disorder were not included in this thesis; instead the focus was on depression, anxiety and stress symptoms. Future research, including a wider range of mental disorders, will therefore provide a more comprehensive understanding of FIFO mining employee mental health and more generalisable findings.

While research on depression and stress in the workplace has received considerable attention, work-related suicide is systemically underreported. The mental health symptoms examined in this thesis (depression, anxiety and stress) and substance misuse were elevated among WA FIFO mining workers ([Harvey, 2013](#); [Vojnovic & Bahn, 2015](#)) compared to the general population. This group has been recognised as a major risk for suicide ([Ferrari et al., 2014](#)), contributing to half of Australian suicides between 2001 and 2010 with a recorded associated cause of death ([Australian Bureau of Statistics, 2012](#)). A deeper focus on the relationship between mental health and substance misuse at work and work-related suicide will enable more effective management of these issues. Extending this research to include other job demands (e.g., working underground) and the consequences of the health erosion pathway (e.g., substance misuse) will also be valuable. The findings of this study supported adjustment, psychological distress and stigma as predictors of help-seeking intentions, and future longitudinal studies will further develop our understanding of the pathways and causal relationships. It is also acknowledged that there may be other important variables that warrant inclusion in future research but were outside the scope of this thesis.

7.8.2 Theoretical Development

There is a lack of theoretical understanding about the impact of adjustment on depression and anxiety. Prior research linked psychological adjustment and mental health, yet few studies have tested the relationships between cultural adjustment and psychological outcome variables

(e.g., depression, anxiety and stress). In particular, difficulties with adjustment may increase stress and psychological distress. On the severe end of the adjustment spectrum, adjustment disorder (caused by stress) often occurs alongside depression and anxiety, therefore, adjustment difficulties are conceptually an antecedent factor of mental disorders. It was apparent in the current study that those who experienced difficulties adjusting to the FIFO mining lifestyle and all it entails (i.e., frequent travel, eating in a mess hall, living and working with co-workers) had a more difficult time in psychological terms. Further research, examining structural models of the stressor-stress-strain relationships, including adjustment as a variable, will therefore be beneficial. Examining other processes (e.g., helplessness, cognitive dissonance and apathy) may also further our understanding of the ways in which stigma affects help-seeking intentions and behaviour.

Levels of FIFO mining employees' adjustment, psychological distress and stigma are changeable over time. Stigmatised beliefs about mental illness can potentially be reduced by attending mental health training and workers becoming increasingly comfortable acclimatising to the role. It will be valuable to capture such changes over time to determine how variations influence help-seeking behaviour. In this regard, research assessing the effect sizes of the dynamic relationships in the dual pathways between psychological distress and stigma will provide further clarity about the long-term effects.

Future studies could also examine alternative sequential ordering of the variables longitudinally. Identifying and trialling practical strategies with the aim of alleviating mental health problems and promoting help-seeking behaviour among FIFO employees will be beneficial for both organisational performance and individual health outcomes. Examining the effects of an expanded WHS approach to address psychosocial hazards, such as the Hierarchy of Risk Control promoted by the WA Department of Mines, Industry Regulation and Safety ([WA Department of Mines, 2018](#)) will also assist our understanding of the long-term viability.

This study examined the relationship between psychological distress and stigma, acknowledging that the relationship is a cyclical one. For example, individuals who access mental health services may feel “labelled” by a medical diagnosis and therefore experience increased stigma. This labelling effect has strong and long-lasting effects on mental health ([Link et al., 1997](#)). Theoretically, however, the direction of the main effect shows that mental health affects stigma ([Vogel et al., 2009](#); [Wade et al., 2015](#)). Following this initial cause, a dynamic interaction between stigma and mental health occurs, with each negatively influencing the other. For this reason, the current research focused on the dominant mechanism, viz., the effects of mental health on stigma, and the model could be replicated to confirm effect size.

This investigation into mental health in an employment context has responded to a more general appeal by [Bailey, Dollard, and Richards \(2015\)](#) for future research to advocate for improved working environments and workers' health. Understanding the moderating effects of job contexts on the Process Theory of Help-seeking can be extended by including job challenges inherent in specific contexts. The dimensions of Psychosocial Safety Climate outlined by [Dollard and Bakker \(2010\)](#), namely, psychological demands (e.g., work family conflict, work pressure, emotional demands), bullying, harassment, physical demands, resources (e.g., social support, rewards, job control), offer new opportunities for developing theory and merit additional attention. It would also be valuable for further PSC research to expand current Australian industry benchmarks into subsections of the industry workforce and explore additional contextual job demands and resources.

7.9 Conclusions

The research was conducted to elicit empirical evidence on Australian FIFO mining employees and their incidence of mental health problems and help-seeking behaviours. The fundamental aims were to further theoretical understanding about these issues and inform public policy, with the research objectives of: (a) gauging the extent to which FIFO mining employees experienced mental health problems; (b) examining the interrelationships between different dimensions of FIFO mining employees' mental health and their influence on help-seeking behaviour; and (c) examining the influence of FIFO working conditions on the different dimensions of mental health and help-seeking behaviour. The results were discussed in the context of the Western Australian mining industry and contemporary occupational health psychology.

A review of the extant literature revealed only a small number of previous studies on the mental health and help-seeking behaviours of FIFO mining employees. However, available evidence ([Bowers et al., 2018](#); [Henry et al., 2013](#)) and the reports of three Australian parliamentary inquiries ([Department of Infrastructure and Regional Development, 2014](#); [House of Representatives, 2013](#); [WA Education and Health Standing Committee \(final report\), 2015](#)) suggested that FIFO mining employees experienced increased levels of mental health problems associated with their work arrangements. The prevalence of mental disorders and why they occur has been largely unknown, and the need for additional empirical evidence to assess the extent of mental health problems and identify the antecedent factors has become increasingly pressing. Of theoretical significance, this thesis provides information on how adjustment, psychological

distress, stigma and help-seeking processes relate to one another and are moderated by (two) job demands. Further, development of the moderated mediation model of mental health and help-seeking advanced our understanding of the TPB and the Process Theory of Help-seeking and extended the use of the JD-R/PSC models. Importantly, the study demonstrates that stigma has a key effect on help-seeking behaviour and suggests individual cognitive processes are important mediators of help-seeking intentions. The findings of the moderated mediation highlighted the importance of including working conditions when examining relationships between adjustment, mental health problems, stigma and help-seeking. This exploration of various dimensions of mental health and help-seeking in the Australian FIFO mining industry adds to the current debate and holds the promise of informing effective practical strategies and influencing public policy.

A range of recommendations for future research and theory development have also been discussed. Future research could be broadened to include developing and trialling practical strategies for alleviating mental health problems and promoting help-seeking behaviours. In addition, clarifying the role of mining companies, government departments and community support services in protecting and promoting employee mental health will form the basis of positive future strategies. In terms of theoretical development, studies examining the stressor-stress-strain relationship in an organisational context could be strengthened by the inclusion of adjustment, while deeper understanding of the effects of stigma on help-seeking intentions and behaviour and the cognitive processes involved will further expand this line of inquiry.

Finally, this thesis combined previously linked, but hitherto untested internal processes in combination, and examined how they were affected by FIFO mining working conditions. In summary, the unique and novel contributions of this thesis are: (i) it quantifies the prevalence rates of depression, anxiety and stress symptoms experienced by FIFO mining employees; (ii) offers new insights into the associations between adjustment, psychological distress, stigma and help-seeking among FIFO mining employees; and (iii) assesses the influence of various job demands on those relationships. It also provides a new empirical model for (potential and) useful application in other organisational research.

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Appendix 1 Instruments among FIFO mental health studies

Of the studies that have assessed FIFO worker mental health, four different instruments are predominantly employed. These are the General Health Questionnaire (GHQ-12); Kessler Psychological Distress Scale (K-10); Beck Depression Inventory (BDI-II); and the Depression Anxiety Stress Scales (DASS-21, DASS-42). These instruments are correlated yet not directly comparable, creating difficulty in establishing the generalisability of results between studies and between FIFO employees and the general population.

Studies that used the General Health Questionnaire (GHQ-12) ([Goldberg & Williams, 1988](#)) are helpful in establishing that psychological distress is most likely prevalent among this population, however, is too general to indicate what particular symptoms or disorders are present. The difficulty of comparing studies that use different measures is partly alleviated by the two studies ([Bowers & Lo, in preparation](#); [Henry et al., 2013](#)) that used the Kessler Psychological Distress Scale (K-10) ([Kessler et al., 2003](#)). This data can be directly compared to Australian National Health Survey data ([Australian Bureau of Statistics, 2009, 2016a](#)), made possible because the same instrument is used. This comparison increases confidence in the generalisability of [Bowers and Lo \(in preparation\)](#) and [Henry et al. \(2013\)](#)'s findings and as a further advantage, psychological distress can be assessed across other individual differences including age, gender and location. Therefore, the results of [Bowers and Lo \(in preparation\)](#); and [Henry et al. \(2013\)](#), which identified higher levels of psychological distress (25-36 per cent) among FIFO employees than the Australian general population (20 per cent), are considered the best indicator of prevalence in the currently available research. Similar to the GHQ-12 ([Beck, Steer, & Brown, 1996](#)), the K-10 provides a measure of psychological health yet is unable to specify particular disorders.

The Beck Depression Inventory-II (BDI-II) ([Beck et al., 1996](#)) used by [Miller \(2014\)](#) indicates a specific disorder (depression) yet not others. The BDI differs from the DASS Depression subscale primarily as the BDI includes items of insomnia, weight loss, somatic preoccupation and irritability, which are unable to discriminate between depression and other affective states ([Lovibond & Lovibond, 1995](#)). Studies that assess mental health using the DASS, either the 21 or 42 item version ([Lovibond & Lovibond, 1995](#)), have the advantage of specifying mental disorders. As particular mental disorders relate to different constructs, this can allow a deeper understanding of what antecedent factors may contribute to different mental health problems in the context of FIFO employment, such as stress related to the work-home transition

period ([Clifford, 2010](#)). Importantly, specifying mental disorders can indicate different treatment interventions.

Appendix 2 Survey questionnaire

Questionnaire for Fly-In/Fly-Out (FIFO) well-being study

Philippa Vojnovic

INSTRUCTIONS: This questionnaire will take approximately 20 minutes to complete. There are six sections; some are shorter than others. Please check boxes, circle answers or fill spaces as required. Your time and participation is appreciated.

Section 1:

1. Are you Male ☐ Female ☐

2. Which best describes your current living situation:

Living with a partner and children

☐

Living with a partner and with no children

☐

Living with children

☐

Not living with a partner or children

☐

Other. Please specify

☐

3. How old are you? Years.

4. What is your highest level of formal education?

Did not achieve year 12 high school qualification

☐

High school

☐

Vocational (TAFE/trade)

☐

Tertiary (university degree)

☐

None of the above

☐

5. How many years/months have you worked on a FIFO basis?

.....Years.....Months

6. How long have you been in your current role?Years.....Months

7. Which roster are you employed on?

Please specify and circle days or weeks.Days/weeks onDays/weeks off

8. Please indicate where you are on your current roster rotation

During your 'rostered off' period

☐

During your 'rostered on' period

☐

During your commute period (traveling to work)

☐

During your commute period (traveling from work)

☐

9. Which geographical region best describes your employment location?

Please check box:

Kimberly

☐

Pilbara

☐

Goldfields – Esperance

☐

Gascoyne

☐

Offshore

☐

Gorgon Island

☐

South Western Australia (Wheatbelt/Great Southern)

☐

Mid-West

☐

10. How much time, on average, does it take you to travel to your work site (from the time you leave home, until you arrive in your work accommodation)? Hours. Please include travel time to and from the airport, airport waiting time, and flight time.

11. On average, how many hours are you employed to work per day, including overtime? Hours.

12. What is your job title?

.....

13. What is your weekly pay rate after tax (take home pay)?

Less than \$1,500 ☐

\$1,

500-2,499 ☐

\$2,

500 or more ☐

14. Do you hold a supervisory or management position? Yes ☐ No ☐

15. Are you on a permanent or fixed term or casual employment contract?

Permanent or fixed term ☐

Casual ☐

Section 2:

INSTRUCTIONS: Please indicate to what extent you have adjusted to the following factors while on your roster period:

1 = Not at All 2 = Slightly 3 = Somewhat 4 = Reasonably 5 = Considerably 6 = Completely

a) Living conditions in general	1	2	3	4	5	6
b) Housing conditions	1	2	3	4	5	6
c) Food	1	2	3	4	5	6
d) Entertainment/ recreation facilities/ opportunities	1	2	3	4	5	6
e) Socialising with other workers	1	2	3	4	5	6
f) Interacting with other workers on a day to day basis	1	2	3	4	5	6
g) Living away from family and/or friends	1	2	3	4	5	6
h) Length of time spent working each day	1	2	3	4	5	6

Section 3:

INSTRUCTIONS: Please read each statement and circle a number 1, 2, 3 or 4 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.

The rating scale is as follows:

- 1 Did not apply to me at all
- 2 Applied to me to some degree, or some of the time
- 3 Applied to me to a considerable degree, or a good part of time
- 4 Applied to me very much, or most of the time

1 I found it hard to wind down

1 2 3 4

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

Section 4:

1. If you were having a personal or emotional problem, how likely is it that you would seek help from the following people?

INSTRUCTIONS: Please indicate your response by circling the number that best describes your intention to seek help from each help source that is listed.

1=Extremely Unlikely, 2=Very Unlikely, 3=Unlikely, 4=Neither Unlikely or Likely,

5=Likely, 6=Very Likely, 7=Extremely Likely

i)	Intimate partner (e.g., girlfriend, boyfriend, husband, wife, de' facto)	1	2	3	4	5	6	7
j)	Friend (not related to you)	1	2	3	4	5	6	7

k) Parent	1	2	3	4	5	6	7
l) Other relative/family member	1	2	3	4	5	6	7
m) Mental health professional (e.g. psychologist, social worker, counsellor)	1	2	3	4	5	6	7
n) Phone helpline (e.g. Lifeline)	1	2	3	4	5	6	7
o) Doctor/GP	1	2	3	4	5	6	7
p) Minister or religious leader (e.g. Priest, Rabbi, Chaplain)	1	2	3	4	5	6	7
q) I would not seek help from anyone	1	2	3	4	5	6	7
r) I would seek help from other (please list in the space provided, e.g., work colleague. If no, leave blank)_____	1	2	3	4	5	6	7

2. If you were experiencing suicidal thoughts, how likely is it that you would seek help from the following people?

INSTRUCTIONS: Please indicate your response by circling the number that best describes your intention to seek help from each help source that is listed.

1=Extremely Unlikely, 2=Very Unlikely, 3=Unlikely, 4=Neither Unlikely or Likely,

5=Likely, 6=Very Likely, 7=Extremely Likely

a) Intimate partner (e.g., girlfriend, boyfriend, husband, wife, de' facto)	1	2	3	4	5	6	7
b) Friend (not related to you)	1	2	3	4	5	6	7
c) Parent	1	2	3	4	5	6	7
d) Other relative/family member	1	2	3	4	5	6	7
e) Mental health professional (e.g. psychologist, social worker, counsellor)	1	2	3	4	5	6	7
f) Phone helpline (e.g. Lifeline)	1	2	3	4	5	6	7
g) Doctor/GP	1	2	3	4	5	6	7
h) Minister or religious leader (e.g. Priest, Rabbi, Chaplain)	1	2	3	4	5	6	7
i) I would not seek help from anyone	1	2	3	4	5	6	7
j) I would seek help from other (please list in the space provided, e.g., work colleague. If no, leave blank)_____	1	2	3	4	5	6	7

Section 5:

INSTRUCTIONS: Imagine you had an emotional or personal issue that you could not solve on your own. If you sought counselling services for this issue, to what degree do you believe that

the people you interact with would _____. Please indicate your response by circling the number that best describes your belief.

1 = Not at all 2 = A little 3 = Some 4 = A lot 5 = A great deal

	1	2	3	4	5
1. React negatively to you					
2. Think bad things of you	1	2	3	4	5
3. See you as seriously disturbed	1	2	3	4	5
4. Think of you in a less favourable way	1	2	3	4	5
5. Think you posed a risk to others	1	2	3	4	5

Section 6:

1. Is there anything you would like to say about your experiences of adjusting to the work, or social aspects, of a FIFO lifestyle?

.....

.....

.....

.....

.....

.....

2. Is there anything you would like to say about your experiences of emotional well-being (such as depression, anxiety or stress) as a FIFO worker?

.....

.....

.....

.....

.....

.....

3. Is there anything you would like to say about your experiences of accessing support (formal or informal) as a FIFO worker?

.....

.....

.....

.....

.....

.....

4. If you would you like to discuss your experiences in a 30 minute interview, either in person or over the telephone, please complete your contact details and the researcher may contact you. You will remain anonymous and will not be identified in any way in reports arising from this interview.

If yes, please complete the contact details below.

Name:

.....
.....

Phone number:

.....
.....

Preferred contact days/times:

.....

Email address:

.....
.....

Is it okay to leave a voicemail message?

Yes ☐ No ☐

Yes

Is it okay to send a text message?

Yes ☐ No ☐

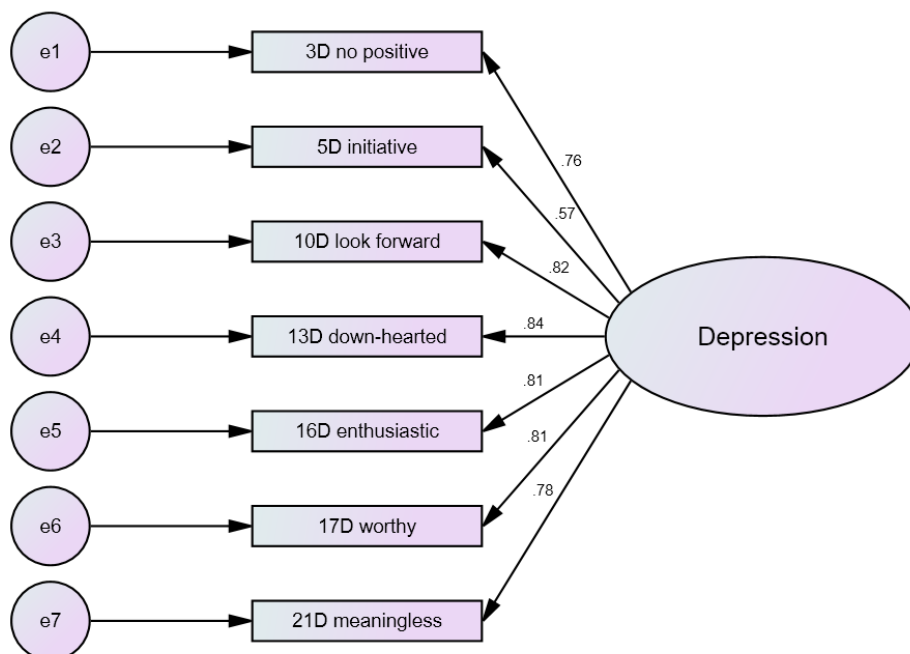
Yes

Thank you for taking the time to participate in this study. Your responses are greatly appreciated.

Appendix 3 of this thesis has been removed as it may contain sensitive/confidential content

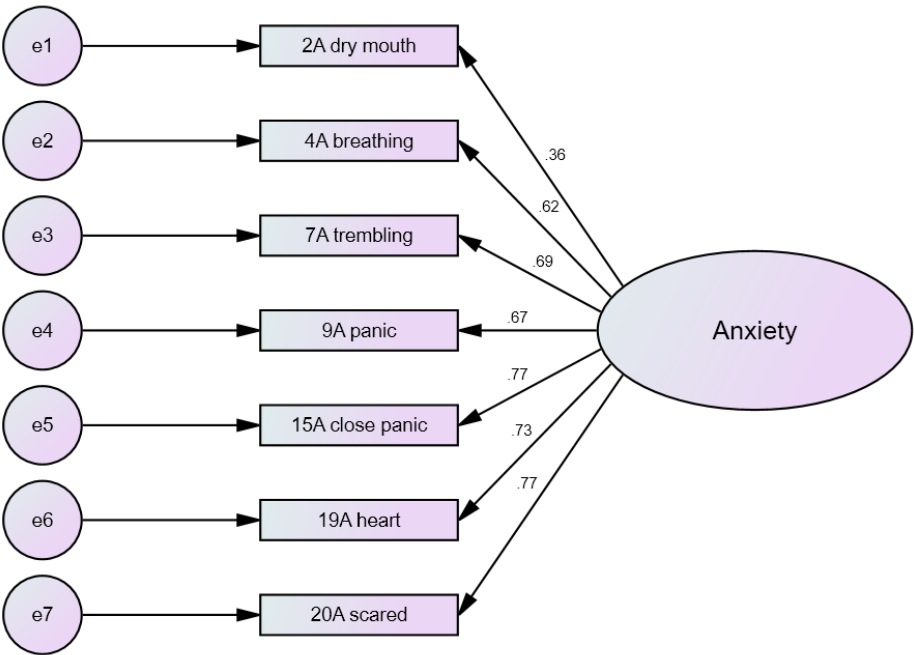
Appendix 4 OCMs DASS-21 and GHSQ subscales

Figure 0.1 One-factor congeneric model for the Depression sub-scale



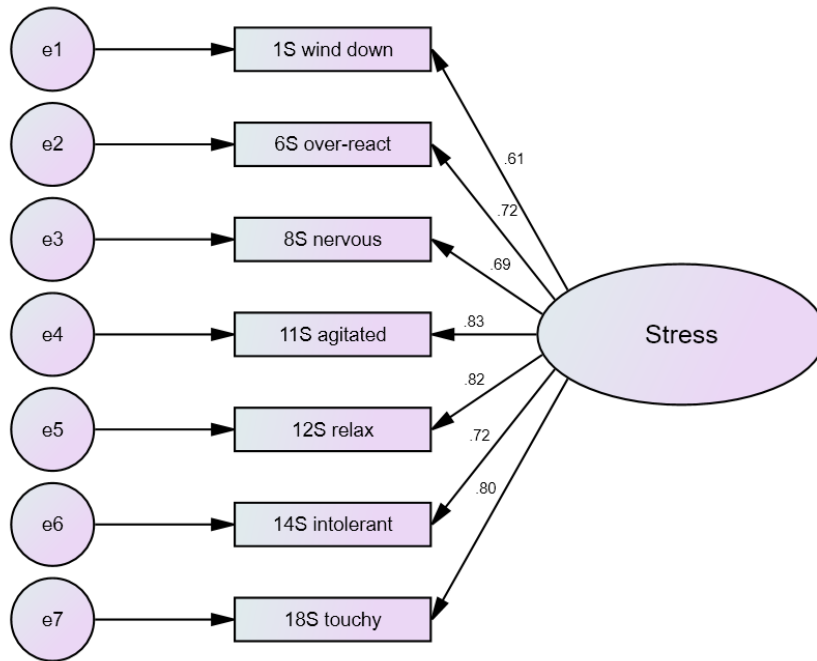
Note: Ellipses represent latent variables and rectangles represent manifest variables.

Figure 0.2 One-factor congeneric model for the Anxiety sub-scale



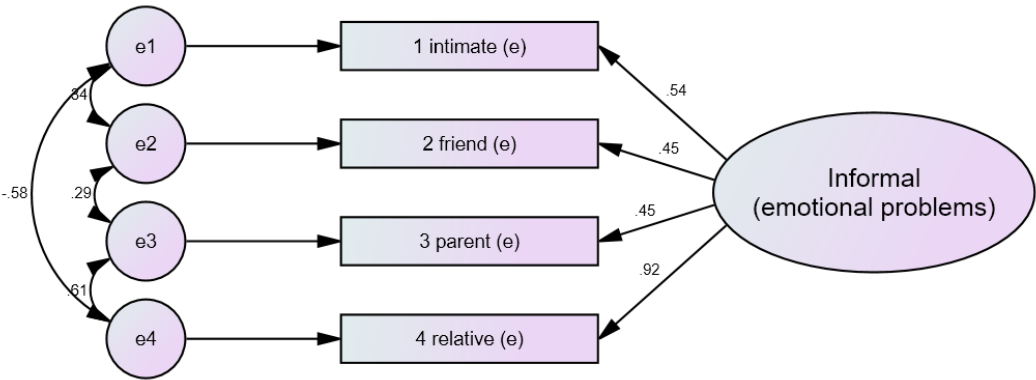
Note: Ellipses represent latent variables and rectangles represent manifest variables.

Figure 0.3 One-factor congeneric model for the Stress sub-scale



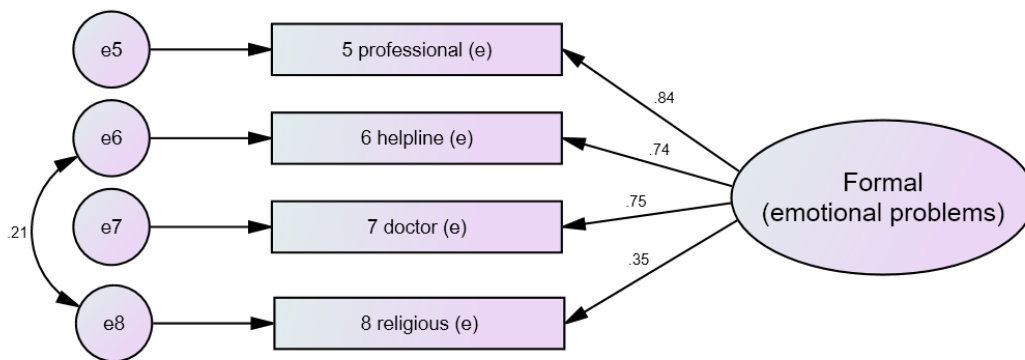
Note: Ellipses represent latent variables and rectangles represent manifest variables.

Figure 0.4 One-factor congeneric model for the Informal sub-scale (emotional problems)



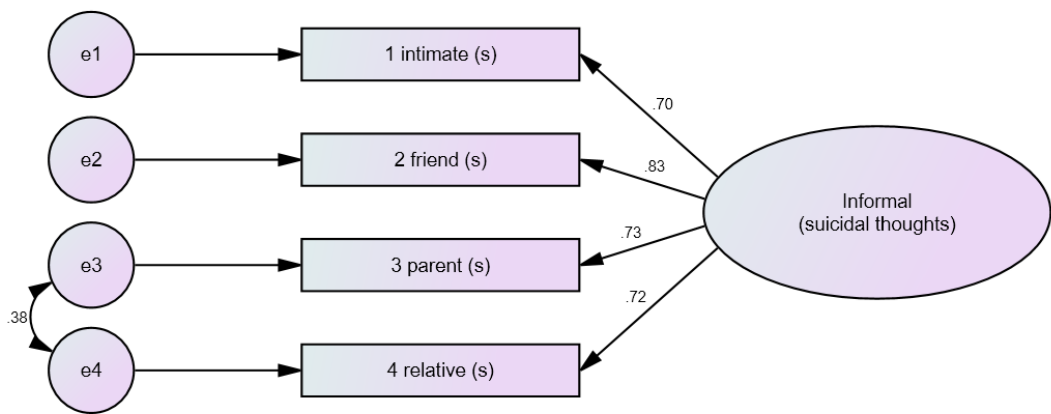
Note: Ellipses represent latent variables and rectangles represent manifest variables.

Figure 0.5 One-factor congruence model for the Formal sub-scale (emotional problems)



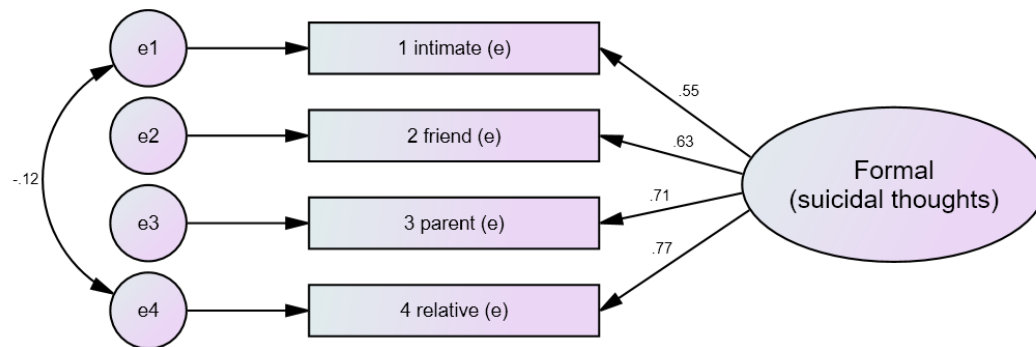
Note: Ellipses represent latent variables and rectangles represent manifest variables.

Figure 0.6 One-factor congeneric model for the Informal sub-scale (suicidal thoughts)



Note: Ellipses represent latent variables and rectangles represent manifest variables.

Figure 0.7 One-factor congeneric model for the Formal sub-scale (suicidal thoughts)



Note: Ellipses represent latent variables and rectangles represent manifest variables.

Appendix 5 Media: Vice-Chancellor's Student Awards

This award example is included to demonstrate the applicability of the thesis to the wider community.

Students shine in Vice-Chancellor's Student Awards

Tuesday, 05 August 2014



Vice-Chancellor's Student Awards 2014 recognises Rachel Robson (left), Philippa Vojnovic (right) for their work.

Related Contents

Vice-Chancellor's Student Awards 2014 recently recognised and rewarded outstanding achievements of individual students or student team. Faculty of Business and Law (FBL) students received two of the three mentions within the Engagement category.

Congratulations to FBL Law student, Miss Rachel Robson, winner of the Engagement category. Rachel represented ECU through strong collaborations in her role with the WA Parliamentary Research Internship Scheme, and for volunteering her services and legal knowledge to community service agencies and organisations.

Rachel was very proud of this achievement, and acknowledged ECU as a very supportive and generous University.

"I think ECU is a university that is growing by the day, and I am humbled to be able to be a part of that experience. The work I have completed while studying at ECU with the Innocence Project, the Parliamentary Internship plus tutoring through the ITAS Program all involve engagement - engagement with other students, with the community and with other academics. The completion of this work and units has been an incredible learning experience," says Rachel.

"Getting the name of ECU out into the market is something that is important - the students at ECU receive excellent opportunities and support from the staff to further their skills, aim for personal excellence, in addition to teaching us to look beyond and challenge ourselves."

Rachel is currently challenging herself by competing in the ADR International Moot in Hong Kong, and she has this important message for other ECU students: *"What I will say to the students at ECU is it is part of our role, as students and members of the university, to further the name of ECU, to assist the promotion of ECU through engagement with other services and the community. I am fortunate to be a part of this experience."*

Congratulations also go out to FBL PhD student, Philippa Vojnovic, who received a special commendation in the Engagement category for her involvement in engaging with a number of communities, local agencies and industries, providing them awareness of current research issues and promoting collaboration between groups within the FIFO communities.

"I feel delighted to receive a commendation and believe it's important to engage with our communities who can both contribute to, and be affected by, our research. I am thankful to my supervisors who encourage me to make connections and collaborate, such as helping to establish our Fly-In/Fly-Out Australian Community of Excellence. This is a great example of engagement leading to exciting outcomes," says Philippa.

Appendix 6 Media: News Report example

This News Report example is included to demonstrate the applicability of the thesis to the wider community.

Depression Rate Twice as High in FIFO Workers

Wednesday 3rd of June 2015 03:34:51 PM

Research from Edith Cowan University has found Fly-in fly-out (FIFO) workers suffer from depression at more than twice the rate of the general Australian population.

Out of 629 WA FIFO workers surveyed researchers found that 28 per cent exhibited significant signs of depression, compared to just 13 per cent of the general population.

FIFO workers also exhibited higher rates of stress and anxiety than the general population and non-FIFO mining workers who live in remote and rural areas.

Ms Vojnovic said the study also identified certain groups within the FIFO sector that were particularly at risk of depression.

“Younger workers, aged between 18 and 29 were twice as likely to suffer from depression as their older colleagues. Additionally, workers with a university degree were half as likely to experience depression,” she said.

Lead researcher Philippa Vojnovic, from ECU’s School of Business, said the research highlighted the need for robust support systems to be in place at FIFO workplaces.

“There have been anecdotal reports that rates of suicide is higher among FIFO workers,” she said.

“While there are no statistics available on the rates of suicide in the sector, depression is clearly a risk factor for suicide.”

Scott, (who requested his surname not be used) has worked as a FIFO worker in the mining industry for the past six years. In 2014, suffering from depression he was admitted into a hospital mental health unit.

“I think the main things that contributed to my issues were the isolation from friends and family, the long roster and my fear that if I admitted that I was struggling I could lose my job or co-workers would think less of me,” he said.

“Companies need to inform their workers that it’s okay to talk about mental health and that you’re not going to be fired over it because that’s what a lot of other guys think.”

“I tell my mates and I ask them about their mental health and support them too. I have now learnt how to talk about what I’ve been through because talking helps.”

“When I told my supervisors about my situation they were incredibly supportive.”

Ms Vojnovic will be presenting the results of her research at an event at the University of WA on Friday said, “This isn't about blaming resource companies, it's about helping people who are struggling in silence.”

The Mental Health and Community Impacts of FIFO Work forum will also hear from WA Mental Health Commissioner Tim Marney and MLA Dr Graham Jacobs.

Appendix 7 Public Submission Report example

This Submission example is included to demonstrate the applicability of the thesis to forming public policy.

Submission to the Infrastructure, Planning
and Natural Resources Committee

FIFO Australian Community of Excellence (FACE)

December 2016

Strong and Sustainable Resource Communities Bill 2016

AUTHORS OF THIS SUBMISSION ARE MEMBERS OF FACE

Authors:

***Philippa Vojnovic, Counsellor/Psychotherapist and PhD Candidate, Macquarie University,
Department of Marketing and Management***

Stephen Gallagher, Team Leader, Regional, Rural and Remote Education Services, Ngala

Zoe Tierney, Coordinator of Justice Services, Communicare

***Lorili Jacobs, Women's health researcher and PhD candidate, University of Western Australia, School of Population
Health and WA Centre for Rural Health***

Background: FIFO Australian Community of Excellence (FACE) www.facenetwork.com.au

PURPOSE

To promote safe, supportive FIFO* work practices and lifestyle informed by evidence-based research and to influence policy.

**Fly-In Fly-Out (FIFO) includes Drive-In Drive-Out (DIDO), Bus-In Bus-Out (BIBO), working away and long distance commute.*

WHAT WE DO

- Collect, generate and disseminate accurate information as the peak nonprofit FIFO organisation
- Present an evidence based view, often giving voice to most unheard FIFO stakeholders, workers and community members
- Build a network of expertise with a view to supporting FIFO as a sustainable lifestyle
- Provide opportunities for policy makers, industry and individuals to work together
- Create an inclusive community for any stakeholder to share and learn
- Maintain a library of FIFO knowledge

HOW WE DO IT

- Consult
- Listen
- Connect
- Share
- Encourage conversations
- Promote understanding

OUR VALUES

- Fair to all (Balanced, impartial)
- Use the truth (Evidence-based)
- Build goodwill (Reciprocal partnerships)
- Beneficial to all (Stabilise, normalise)

FACE is a non-profit association open to researchers, FIFO workers, policy makers, service providers and community members interested in all elements of Fly-In Fly-Out (FIFO), long-distance commute work, health and lifestyle usually related to mineral and energy exploration, construction or production. As an independent multidisciplinary network, FACE has been created to promote and advance sustainable FIFO work practices via collaboration with like-minded individuals and businesses. Our organisation facilitates on-going dialogue nationally and internationally to advance knowledge through mutually beneficial relationships.

Enquiries@facenetwork.com.au; Level 2, 949 Wellington St, West Perth, Western Australia 6872

EXECUTIVE SUMMARY

Fly-In Fly-Out (FIFO) for this submission applies to Drive-In, Drive-Out (DIDO) and Long Distance Commuting (LDC) work practices defined as requiring travel on a regular basis for an extended period, over such a distance from the employee's home that they are not able to return to their permanent residence at the end of a shift. This submission incorporates contributions from a range of expert academics and service providers.

The three recommendations in the current submission are straightforward.

First, regarding the reference point 9 (lines 7-27):

“(2) The owner or proponent must, as part of the EIS for the project, prepare a social impact assessment that—

(a) provides for the matters mentioned in subsection (3); and

(b) includes the matters stated in the guideline made under subsection (4).

(3) The social impact assessment must provide for the following in relation to the project—

(a) community and stakeholder engagement;

(b) workforce management;

(c) housing and accommodation;

(d) local business and industry procurement;

(e) health and community well-being.”

We submit that (a) the social impact assessment in subsection (3e) be changed to include the term “mental health” along with the existing “health and community well-being” and reads instead as “mental and physical health and community well-being” and (b) that additional considerations be included in the social impact assessments of large resources projects.

Therefore, submit that the underlined changes to the Bill point 9 be changed to read: “(e) mental and physical health and community well-being.”

Second, regarding reference point 12 (lines 17-23):

“Coordinator-General may nominate large resource project as a project for which persons employed during construction phase are workers for this Act The Coordinator-General may, as part of the EIS for the project, nominate a large resource project as a project for which a person employed during the construction phase of the project is a worker for this Act.”

We submit that the underlined changes to the Bill point 12 be changed to read:

“The Coordinator-General shall nominate large resource project as a project for which persons employed during construction and de-commission phases are workers for this Act The Coordinator-General *shall*, as part of the EIS for the project, nominate a large resource project as a project for which a person employed during the construction and de-commission phases of the project is a worker for this Act.”

Third, regarding the definition of a ‘nearby regional community’ as “a town, the name of which is published on the department’s website under section 13, that has a population of more than 200 people, any part of which is — (a) within a 100km radius of the entrance to the project that is closest to the town’s boundary; or (b) within a greater or lesser distance from the project decided by the Coordinator-General and notified in writing by the Coordinator-General to the owner of the project.”

We submit that the definition may be expanded to encompass all affected residents within a set area around the project rather than a town. Therefore, it may be defined not only by distance and population but by where practicable for local residents to work at the project.

In addition to other recommendations incorporated within this submission and because similar questions continue to arise at inquiries and in multiple reports, we strongly advocate that action be taken to address the barriers to (i) sharing of knowledge related to the impact of FIFO on individuals and communities, (ii) acceptance of evidence by policy makers and industry; (iii) building a cohesive national structure to respond to identified FIFO practice problems; and (iv) policy is developed to enable better data collection and availability of such data between industry and government.

The FACE network authors from the FIFO working community thank the Government of Queensland and the Infrastructure, Planning and Natural Resources Committee for the opportunity to make a submission to the development of the Strong and Sustainable Resource Communities Bill 2016. Our lead author Philippa Vojnovic from Perth is available by telephone (0410 152 992) or email (Philippa@facenetwork.com.au) should any further information be required.

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1. CONSIDERING REFERENCE POINT 9 (PAGE 9, LINES 7-27)

Rationale for suggested modifications to point 9

The Strong and Sustainable Resource Communities Bill 2016 (hereafter referred to as the Bill) proposes that:

“(2) The owner or proponent must, as part of the Environmental Impact Statement (EIS) for the project, prepare a social impact assessment that—

- (a) provides for the matters mentioned in subsection (3); and*
- (b) includes the matters stated in the guideline made under subsection (4).*

(3) The social impact assessment must provide for the following in relation to the project—

- (a) community and stakeholder engagement;*
- (b)* workforce management;*
- (c)* housing and accommodation;*
- (d)* local business and industry procurement;*
- (e)** health and community well-being.*
- (4) (no modifications suggested)”*

*considerations submitted for items 3b-e

**modifications submitted for item 3e

We contend that the title of the Act suggests an outcomes based focus. There is however, limited provision for this. Instead it appears that the changes proposed by this bill gives the Coordinator General significant discretionary powers, which limits the transparency of the Act in how it achieves it desired outcomes.

The Anti-Discrimination Act 1991 appeared to have already covered much of the discrimination that this Bill proposes to address. In doing so, it goes as far as to encourage employers to engage in the education and training of workers. There does not appear to be an allowance for this within the this Bill with regards to addressing issues that are likely to arise around education and training when attempting to engage local residents as workers, who may not of previously had opportunities to engage in the necessary tickets of qualifications. In addition, there does not appear to be any indication of how sustainability will be achieved over the life of a project, with the construction phase involving more personnel than the operation phase and then the decommissioning phase requiring less people again.

We recommend that the following are aspects considered in the social impact assessment by The Coordinator-General and provides for the following in relation to the project for:

1. Workforce management;

1.1 Consider mechanisms to provide options for reduced hours or shift rotations to enhance community participation for FIFO and non-FIFO workers.

1.2 The employment of indigenous workers drawn from the local community be prioritised, followed by residents and then non-residents.

2. Housing and accommodation;

2.1 Consideration needs to be given to the potential to accommodate workers in the boundaries of a town so as to increase the workforce integration into the community.

2.2 This needs to be considered alongside the capacity of the town to adjust and cope with an increase in its population.

2.3 Where FIFO camps are built in the boundaries of towns to bring economic and social benefits to both residents and workers, guidelines and assurances need to be provided about mechanisms to manage negative social impacts to community residents.

2.4 The provision and opportunity to grow a sustainable population in a region should be considered through the provision of community based family household accommodation.

2.5 This can provide choice to workers where families consider a relocation to a regional community as an opportunity to maintain a family lifestyle closer in line with their expectations.

2.6 Site or Camp/town accommodation that can accommodate and facilitate the visits of partners, family members and children is something that could be considered.

2.7 This would help families to understand and support the FIFO workers role and minimise some of the disconnection family's experience.

2.8 Accommodation/housing availability for non-industry related personnel, is often an issue if a site creates an increase or demand for growth of service industries and essential service personnel.

2.9 The physical availability of land to be released for new housing, the utilisation of existing housing stock and suitability for housing to meet the needs of family households has created inflated prices and shortages in other regional areas so should be accounted for in the social impact.

3 Local business and industry procurement;

3.1 Anecdotal reports indicate that mining companies frequently extend dates for paying invoices from the common 30 days to 60 days.

3.2 This may pressure small community businesses.

- 3.3 To promote local community benefits, social impact assessment should consider the intention of the mining company to pay local businesses in a timely manner.

4 Health and community well-being

- 4.1 We request that (a) the social impact assessment in subsection (3e) be changed to include the term “mental health” along with the existing “health and community well-being” and reads instead as “mental and physical health and community well-being” and; (b) that additional considerations be included in the social impact assessments of large resources projects.
- 4.2 There is currently mounting evidence of the importance of mental health in the FIFO employment context. Rather than re-list these, we refer to the following documents in the reference list and in particular would like to draw the Committee’s attention to the Final report of the Health and Education Standing Committee of the Legislative Assembly Inquiry into mental illness in Fly-In Fly-Out workers. FIFO Australian Community of Excellence. Perth, Australia.
- 4.3 These documents clearly argue that mental health and the management of psychosocial hazards are of key importance for workers in the FIFO context.
- 4.4 If mental health is not included as a necessary aspect of a social impact assessment, the risk is that it will not be explicitly considered.
- 4.5 Therefore, it is recommended that (a) the social impact assessment in subsection (3e) be changed to include the term “mental health” along with the existing “health and community well-being”.
- 4.6 The level of workforce integration a community can accommodate needs to be assessed thorough engagement with community stake holders. This is particularly relevant depending on the introduction of DIDO, BIBO, FIFO and or residential mix of integration.
- 4.7 Consideration to the capacity of key services for example, health, recreation, policing, education, retail, and infrastructure services needs to be given. Community access to mining provided infrastructure creates opportunities to improve health and wellbeing for communities.
- 4.8 Guidelines and mechanisms are required to account for any change or growth in population that may impact on services’ abilities to meet community needs. For example, (a) where towns internet speeds are highly impacted by increased population and added loads in peak periods with no added capacity this impacts the quality of life and wellbeing of the community; (b) Where local medical services are booked out with FIFO or industry related workers and there is less access for parents with children this affects community wellbeing.
- 4.9 The location of airstrips, access to seats on flights, upgraded water, gas and electricity utilities, provision of mobile phone towers etc. are some examples of where positive social impacts can be contributed.
Shared use of multipurpose facilities are further examples that increase integration of workers as well as adding to the amenities that provide health outcomes for towns and workers.

The provision of workers to volunteer and be involved in local community activities, sporting, and social clubs would be a consideration that could positively impact the workers wellbeing but also add to the capacity of wellbeing in the community. Social impact assessment may also consider the long term social impacts in source communities where FIFO workers originate. It is unclear how information from industry can fill gaps in legislative authority. It is therefore considered that where practicable, mining companies should collect employee data on mental health issues including: Employee Assistance Program (EAP) statistics, worker's compensation claims for mental stress and suicide. Information on employee suicides should be made available to the Coroner's office. This will enable companies to keep a more accurate picture of the FIFO workforce. Therefore, we submit that policy should be developed to enable better data collection and availability of such data between industry and government. To improve community well-being it is considered that there are benefits to open days provided by the mining company to (a) facilitate family visits to site and family days (b) allow potential future workers to view the worksite and therefore facilitate a better understanding and likely hood of residents seeking and obtaining employment with the company. Therefore it is recommended that the additional considerations discussed in this submission be included in the social impact assessments of large resources projects.

5 In conclusion the underlined changes to the Bill point 9 may then read:

- “(2) The owner or proponent must, as part of the EIS for the project, prepare a social impact assessment that—*
- (a) provides for the matters mentioned in subsection (3); and*
 - (b) includes the matters stated in the guideline made under subsection (4).*
- (3) The social impact assessment must provide for the following in relation to the project—*
- (a) community and stakeholder engagement;*
 - (b) workforce management;*
 - (c) housing and accommodation;*
 - (d) local business and industry procurement;*
 - (e) mental and physical health and community well-being.”*

2. CONSIDERING REFERENCE POINT 12 (PAGE 11, LINES 17-23)

Rationale for suggested modifications to point 12

The Bill proposes that:

“The Coordinator-General may nominate large resource project as a project for which persons employed during construction phase are workers for this Act”.

The Coordinator-General may, as part of the EIS for the project, nominate a large resource project as a project for which a person employed during the construction phase of the project is a worker for this Act.”

The Bill does not explicitly include either the construction phase or de-commissioning phase of the mine. These are often the times where the social impact on communities is at its highest (for example, in construction due to an influx of FIFO workers in larger numbers than in the production phase, in de-commission due to job loss and reduced economic circumstances). Moreover, the construction and decommissioning phases can be lengthy with unclear boundaries when the construction phase becomes a production phase and later slides into a de-commission phase.

It follows that not explicitly naming these phases in the Bill is an omission which make interpretation difficult for mining companies and communities.

Foreseeably, conflict and disputes may arise when (a) members of a local community believe a mine is in a construction phase and is not included in the Act (b) members of a local community believe a mine is in de-commission phase and local residents are not able to gain employment. The current version of the Bill does not appear to contain adequate measures and mechanisms that address construction and de-commission phases to protect the mining companies, communities and residential workers during these phases of a project.

Subsequently, we submit that the construction and de-commissioning phases be explicitly included in the Bill, through definite nomination by The Coordinator-General. We submit that point 12 lines 17, 20 and 21 be changed to “shall nominate” rather than “may nominate”.

We further submit that line 22 be changed to include the term “decommission phase”.

Therefore the underlined changes to the Bill point 12 may then read:

6 *“The Coordinator-General shall nominate large resource project as a project for which persons employed during construction and de-commission phases are workers for this Act*

The Coordinator-General shall, as part of the EIS for the project, nominate a large resource project as a project for which a person employed during the construction and de-commission phases of the project is a worker for this Act.”

3. CONSIDERING THE DEFINITION OF A NEARBY REGIONAL COMMUNITY (PAGE 25, LINES 20-29)

Rationale for suggested modifications to definition

In its current form the Bill 2016 appears to provide limited benefits to the communities that are likely to be impacted by the operation of large resource projects.

Communities have been defined as meaning;

“a town, the name of which is published on the department’s website under section 13, that has a population of more than 200 people, any part of which is — (a) within a 100km radius of the entrance to the project that is closest to the town’s boundary; or (b) within a greater or lesser distance from the project decided by the Coordinator-General and notified in writing by the Coordinator-General to the owner of the project.”

This definition indirectly discriminates against smaller communities and landowners within the regions impacted by operations. Furthermore, it does not account for indigenous communities that meet the population size and distance requirements, but are not designated as belong to or being a town, as defined by the Australian Bureau of Statistics.

We submit that the definition may be expanded to encompass all affected residents within a set area around the project rather than a town. Therefore it may be defined not only by distance and population but by where practicable for local residents to work at the project.

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