Supporting Document

About MATES

Mental ill-health and suicide are significant problems nationwide, with over 3000 people dying by suicide each year (NSPO 2024). This represents 9 Australians per day, 3 times higher than the road toll and 8 times higher than deaths through workplace accidents (Australian Bureau of Statistics, 2023). This further equates to 159,000 years of potential life lost to suicide in Australia each year (NSPO 2024).

Workers in the construction sector are more than twice as likely to suicide compared to other workers (King et al. 2024). Workers with socio-economic factors, workplace stress, bullying, substance abuse, long working hours and other vulnerabilities are at even greater risk (Milner et al. 2017).

MATES is a mental health and suicide prevention charity established in Queensland to address high levels of suicide in the construction industry. Since MATES' inception in 2008, operations have expanded to encompass all other states and territories and New Zealand.

In recognition of program successes in the construction industry and on the invitation of other high-risk sectors, MATES has since expanded its program reach to include mining, energy and manufacturing, providing tailored mental health and suicide prevention program that is designed to fit the specific needs of the industries we serve. This includes adapting program content and delivery to ensure its relatable and accessible to workers who may have traditionally found mental health discussions difficult.

Recognising the need to address suicide in construction, the program was developed from a solid evidence base provided by the Australian Institute of Suicide Research and Prevention: The AISRAP Report. The MATES program leverages the strengths of the industry's culture, context and capability, not only encouraging help-seeking behaviour but also fostering a culture of help-offering.

MATES peer-to-peer support programs focus on empowering individuals to reach out proactively to their colleagues, creating a network where help is offered as a norm rather than waiting for individuals to ask. This approach is critical to making support services more accessible and destigmatising help-seeking behaviour.

In addition to a demonstrated commitment to workers, MATES works with organisations to improve mental health and suicide prevention policies and practices, ranging from Tier 1 companies undertaking significant infrastructure and commercial projects to small businesses engaged in residential contracting.

MATES is a research driven organisation, commissioning and drawing on foundational, collaborative and evaluative research to ensure the program is evidence based and responsive to the needs of workers and organisations in targeted sectors.

MATES is recognised by the World Health Organisation (WHO) as world's best practice in sector-based suicide prevention and has partnered with almost 4,000 worksites to reach over 360,000 workers across Australia.

Construction workers describe their distress as a state where they are "not in control, overwhelmed or unable to cope" (Meurk et al, 2021). It has been found that distress through suicidal distress alongside both suicide and attempted suicide will impact most Australians at some point in their lives as around 135 people are affected by each suicide death (NSPO 2024). People affected can include families, friends, colleagues, carers and communities, as people who are bereaved by suicide have an increased risk of dying by suicide themselves (NSPO 2024). The impact of suicide permeates further than close family, friends or colleagues through to emergency responders and health service workers who experience their own distress that can be long-lasting (NSPO 2024). Reducing this impact includes raising awareness around the long-term effects of distress and risk of suicide for those effected to the same level as those with severe mental health conditions and suicidal ideation (Grafiadeli et al. 2021).

At the same time the construction sector has a growing awareness of the costs of mental ill-health and suicide to projects and business. This includes lost productivity as well as human capital, medical and administrative costs. Recent research in Queensland determined that the cost of a single suicide is as high as $5.38 million, a cost borne by workers, families, employers and government (Doran and Potts, 2024).

Drawing on evidence that construction workers benefit from help offering and help seeking from their work peers, MATES programs empower and encourage workers to respond when a mate is struggling.

General Awareness Training (GAT) is designed to increase mental health literacy and reduces stigma. As of 2024, MATES had trained 331,516 workers in GAT, and 33,078 workers had completed **Connector** training to act as key points of contact for distressed workers and connect them to appropriate supports. The **ASIST** program has further trained 4,145 volunteers to intervene when a co-worker is at risk of suicide.

In addition, the basic building blocks include promotion of information material on sites for engagement, Field Officers to support the volunteer networks, on-site volunteers who inform management about mental health and suicide risk, case management and a 24/7 helpline.

Respond has been recently developed on the request of GAT, Connector and ASIST volunteers, who sought training to help them respond to critical incidents and support peers while a comprehensive critical incident response can be implemented.

Research indicates that apprentices are at particular risk and MATES has developed the **Apprentice Awareness Toolbox** and **Resilience Skills for Apprentices** programs. Acknowledging the importance of supervisor relationships to wellbeing MATES also provides the **MATES Supervisor Program**.

This year, MATES introduced the **Volunteer Toolbox App**, a tool designed to support trained volunteers by offering real-time resources, guidance, and assistance when responding to incidents or helping workers in distress. This app ensures that volunteers have quick access to essential support information, empowering them to be even more effective in promoting workplace mental health.

If further support is needed, **MATES case managers** are standing by to ensure workers that seek help have access to the services and supports they need. Alongside these programs is the 24-hour **MATES Helpline** which is available to construction workers seeking help or advice about how they can help others.

Responding to the need for organisations to document their mental health policies and procedures, more businesses are engaging with the **MATES accreditation process** as evidence for clients that they have understood and responded to psychosocial risks.

Emerging from a series of construction and mental health roundtables, the **Blueprint framework for better mental health and suicide prevention** is administered by MATES and gives organisations the opportunity to audit their current mental health and wellbeing arrangements across 5 key pillars:

- Promote work's positive impact on mental health
- Reduce harmful impacts at work
- Mental health and suicide prevention literacy
- Early intervention and treatment
- Provide return-to-work and ongoing support.

MATES programs and the Blueprint outlines actions that organisations can take in the areas of:

- Strategy,
- Leadership and culture,
- Risk management,
- Training and competency,
- Communications and campaigns,
- Incident and crisis management, and
- Management review and reporting.

In recognition that fly-in, fly out and drive-in, drive out workers experience unique stressors and are often removed from traditional supports, FIFO/DIDO has also been added to the Blueprint framework.

The **MATES Hub** has been developed to empower FIFO/DIDO workers and their support networks with tools and resources to improve their wellbeing. The MATES Hub supports workers and their families with access to the mental health helpline and resources, online training and videos addressing common feelings such as isolation and stress. The MATES Hub further provides workers with the ability to create a suicide safe plan for themselves or a mate in distress.

MATES is a **research driven organisation** that has its origins in the evidence base provided by the Australian Institute of Suicide Research and Prevention report The AISRAP Report (2006). Examples of previous research outputs can be found at MATES Research.

All MATES programs and recommended actions are offered in the knowledge that organisations are at different levels of maturity, with different capacities and resources. MATES' view is that each step, however small, is a step to reducing the emotional, social and economic impact of mental ill-health and suicide.

High risk workers

Male construction workers in Australia have a suicide rate of 26.6 per 100,000 persons, which is approximately twice that of other male workers (Maheen et al. 2022). Suicide rates of Australian male workers within the extraction and manufacturing industries have not been reported, however US reports indicate higher rates within the extraction industry at 49.4 per 100,000 persons (Maheen et al. 2022). These statistics underscore the necessity for targeted mental health funding to effectively support the well-being of workers in these critical fields.

More specifically cohorts within these sectors are identified as being at greater risk, for example apprentices or fly-in/fly-out and drive-in/drive-out workers (Ross et al. 2020). Research indicates that the supervisor-worker relationship is a critical area for enhancing mental health and wellness among these workers (Loudoun et al. 2023).

MATES research and experience indicates that mental health and suicide interventions for workers in high-risk industries are particularly effective when they:

- Draw on a culture of peer-to-peer support and mutual responsibility for safety (Thompson and Doran 2024),
- Are sector-specific suicide prevention programs,
- Employ training facilitators from the targeted sectors (Gullestrup 2023),
- Have 'buy-in' from employers, peak and regulatory bodies workers, and worker organisations (Gullestrup et al. 2011),
- Focus on 'help offering' as well as 'help seeking' (Ross et al. 2019),
- Address mental health literacy and stigma, and
- Aim at improving mental health services and increasing pathways to help.

Given the large number of workers and elevated suicide rates within high-risk industries, it is imperative that intergovernmental agreements empower states and territories to address specific needs and bridge existing support gaps for these groups.

The Federal, state and territory funding ecosystem should empower employers in high-risk industries to identify and implement actions to improve mental health and reduce suicide. Employers must respond to the inclusion of psychosocial hazards in WHS legislation and implement actions to meet Safe Work Australia's Managing Psychosocial Hazards at Work Code of Practice.

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International Journal of
Environmental Research and Public Health

MDPI

Article

Understanding the Barriers and Pathways to Male Help-Seeking and Help-Offering: A Mixed Methods Study of the Impact of the Mates in Construction Program

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Received: 14 June 2019; Accepted: 16 August 2019; Published: 19 August 2019

Abstract: The Mates in Construction (MATES) program was developed to address the issue of high suicide rates among males in the Australian construction industry. The program delivers early intervention training and support to construction workers. This mixed-methods study aimed to (1) examine the effectiveness of training for MATES connectors and (2) examine the barriers, motivations and pathways to help-seeking and help-offering for both MATES connectors and clients. A total of 104 volunteers completed a short survey before and after connector training sessions. Quantitative data analysis showed significant increases in connectors' self-reported suicide awareness, and willingness to offer help to workmates and seek help themselves. For the qualitative component, 27 connectors and clients participated in focus groups and individual interviews. Thematic analysis identified six themes from the connectors' data: awareness, skills and confidence; removing stigma; making a difference; simplicity of the model; understanding the industry; and visibility, camaraderie and passion. For clients, three key themes emerged: barriers and pathways to help-seeking; speaking the same language; and flow-on effects. The results provide evidence for the effectiveness of connector training and indicate that MATES's peer support model is enabling workers to overcome traditional barriers and attitudes to seeking and offering help.

Keywords: suicide prevention; males; construction industry; help-seeking; help-offering; mixed-methods

1. Introduction

There is growing evidence from around the world that males working in the construction sector are in one of the highest occupational risk groups for suicide [1,2]. Mates in Construction (MATES) was developed as a workplace suicide prevention program after research revealed significantly higher suicide rates among Australian men in the construction industry compared to Australian men in general [3]. MATES is a multimodal suicide prevention and early intervention program delivering training and support to workers across a range of areas. Training comprises the following programs:

- General awareness training (GAT) for construction workers—A one-hour session with all workers on a worksite about suicide as a preventable problem faced by the industry, what it looks like when a mate is struggling and how to connect a mate to help;
- Connector training—A four-hour onsite training session for workers who volunteer to become connectors. Connectors are recruited during GAT training (i.e., they tick a box on the training

card to self-nominate). The training includes Livingworks safeTALK [4] training. Connectors are trained to identify and safely engage with people at risk and connect them to professional help; and

- ASIST (Applied Suicide Intervention Skills Training)—A 16 h workshop off site for key workers on site (supervisors, union and safety representatives, first aid/site paramedics) where they are trained to make a safe-plan for a person at risk of suicide and connect them to external resources.

Support is also provided to construction workers and their families through field officers (MATES employees who deliver training and support workers on sites), case managers (MATES employees with a minimum qualification of Bachelor/Master of Social Work or Psychology who provide support to workers and connect them to appropriate clinical and nonclinical services) and a suicide prevention hotline. To date, training has been delivered to more than 184,000 construction workers in Australia, and over 8435 workers have received case management assistance.

Given the importance of evaluation in establishing program effectiveness and in providing essential evidence on the strengths and weaknesses of programs, several studies have sought to evaluate the effectiveness of MATES. In a study of over 7000 construction workers, Gullestrup, Lequertier and Martin [5] were able to demonstrate the social validity and general impact of the MATES program, as well as significant increases in suicide prevention awareness in GAT participants compared to a comparison group. In addition, analysis of the Australian National Coroners' Information System (NCIS) data showed a (non-significant) decrease in male suicides in the Queensland construction industry in the first five years after the introduction of the program compared to the five years before [6]. More recently, GAT training evaluation demonstrated the effectiveness of GAT in shifting beliefs about suicide and mental health [7]. As the impact of training for connectors has not yet been demonstrated, the first aim of the present study was to examine the effectiveness of connector training; specifically, in suicide awareness and knowledge, help-offering and help-seeking.

While it is important to quantitatively determine the effectiveness of MATES, there is also a need for deeper research from a process evaluation perspective to better understand which aspects of the program are working and why. Research into occupational health in males has shown that men are less likely to engage in help-seeking or health promotion behaviours and more likely to conceal mental health issues [8–10]. It is therefore critical to better understand construction workers' barriers, motivations and pathways to receiving help. There is a general lack of qualitative research on male suicide in the construction industry [11], and a knowledge gap exists into how the MATES program impacts clients, as well as the volunteers who provide support. Therefore, the second aim of this study was to address this gap by examining the barriers, motivations and pathways to help-seeking and help-offering of both MATES clients and connectors.

2. Materials and Methods

A mixed-methods design was applied to quantitatively examine the effectiveness of connector training, and qualitatively study the experiences and perspectives of both connectors and clients of the MATES program. The study was approved by the Griffith University's Human Research Ethics Committee (GU Reference number 2017/353).

2.1. Connector Training Survey

Volunteers undertaking connector training between May and June 2018 at construction sites across Queensland, Australia, were asked to complete a short paper-based survey. MATES field officers delivering the training administered the survey to 104 participants immediately prior to and immediately after eight separate connector training sessions. The survey consisted of seven items measuring suicide awareness and knowledge, attitudes to help-seeking and help giving; and one question measuring emotional well-being. The first question, *I am familiar with Mates and Construction and the work that they do* was included in the pretraining survey only. The help-seeking item: *If I was going through a difficult time, feeling upset, or was thinking about suicide, I would be willing to seek help* and list

of response options (e.g., *intimate partner*, *friend*, *doctor*) were adapted from the General Help-Seeking Questionnaire [12]. All of the items in the survey required responses on a five-point Likert scale from 1 = strongly disagree, to 5 = strongly agree. The well-being item required participants to select response items regarding how they were feeling emotionally/mentally from 1 to 5, from 1 = very bad, 2 = bad, 3 = OK, 4 = good, 5 = very good. The data from the pre- and post-surveys was entered by MATES administrative staff and the de-identified data file provided to the researchers for analysis.

2.2. Interviews and Focus Groups

A total of 27 MATES clients and connectors from Brisbane, Australia participated in individual interviews (n = 10) and focus groups (n = 17) between July and November 2017. All focus groups and individual interviews were digitally recorded and professionally transcribed. All participants were provided with written information, including the identity and affiliation of the researchers, aims of the research and confidentiality and informed consent issues, including the right to withdraw voluntarily. All participants were required to provide written consent before taking part in the research.

2.2.1. Connectors

MATES field officers approached and recruited the connectors and arranged times for the focus groups. The groups were conducted by a researcher/trained facilitator, who also obtained informed consent from participants. There were five focus groups, each comprising three to four connectors, with an overall total of 17 participants (all male). The focus groups followed a semistructured format, where participants were asked about their motivations for becoming connectors, how they used the skills from the MATES training, barriers and enablers to help-offering and help-seeking and the positive and negative aspects of their roles as connectors. The groups were of approximately 45 min duration.

2.2.2. Clients

Clients who had received assistance and/or referrals through the program were identified and contacted by their case managers who invited them to participate in the study. Inclusion criteria were limited to individuals for whom it has been more than six months since receiving assistance from MATES and who were deemed by their case managers to not currently be at risk of suicidality. Contact details of clients who indicated their agreement to participate were provided to researchers who arranged individual interviews, either face-to-face or over the telephone. Given the sensitive nature of the topic, the interview format was considered the most appropriate to ensure clients' privacy and confidentiality. Of the 10 case management clients who participated in the study, there were eight male construction workers who had directly received assistance from MATES and two female partners of construction workers who had obtained assistance for their partner or as a couple. A semistructured interview (of approximately 30 min) was conducted where participants were asked about their motivations for seeking help through MATES, how they came into contact with MATES, other help-providing services they were aware of at the time, barriers and enablers to help-seeking and how the MATES program and volunteers were or were not helpful.

2.3. Statistical Analysis

2.3.1. Connectors' Survey

All data were analysed using the SPSS 25 statistical package [13]. Wilcoxon signed rank tests were conducted on each of the pre–post items (suicide awareness and knowledge, help-seeking and help giving and emotional well-being). Reliability analysis demonstrated moderate reliability for the pre-training items (excluding, *I am familiar with Mates and Construction and the work that they do*) ($\alpha = 0.75$) and post-training items ($\alpha = 0.71$).

2.3.2. Interviews and Focus Groups

A generic qualitative approach was applied separately to the focus group and the interview data, using thematic analysis, a method for identifying and analysing themes within the data [14]. In the first phase of the analysis, two researchers, VR and KK, worked independently, reading and re-reading transcripts, note-taking and applying an inductive approach so that coding and theme development were directed by the content of the data. Next, to ensure validity of analysis, the researchers worked together, reassessing themes and interpretations with any discrepancies negotiated until consensus was reached. This iterative revision process was used to create the final list of themes with supporting verbatim examples from the transcripts. Thematic analysis was conducted separately for the connectors and clients.

3. Results

3.1. Connectors' Survey Results

Pairwise deletion was employed for cases that did not provide information for either the pre- or post-measures or both. Final numbers for each of items are shown in Tables 1 and 2. The difference scores were approximately symmetrically distributed, as assessed by a histogram with a superimposed normal curve. Thus, Wilcoxon signed rank tests were conducted to determine the effect of the connectors' training and showed a significant increase in the median score for each of the six suicide awareness, help-seeking and help-offering items. A Wilcoxon signed rank test also showed a significant improvement in how participants felt emotionally/mentally after the training. (Table 1).

Wilcoxon signed rank tests were also conducted to examine the effectiveness of connectors' training on help-seeking intentions (Table 2). Help-seeking intentions significantly increased from before to after training for intentions to seek help from one's intimate partner, friend, close family, workmate, supervisor, doctor, mental health professional, telephone helpline, MATES worker/connector and minister/religious leader. There was no significant change for intentions to seek help from 'another' (i.e., not listed in the response options) or to not seek help from anyone at all.

Table 1. Suicide awareness: pre- and post-connectors' training.

Suicide Awareness Items and Well-Being	Pre-Training						Post-Training						
	N	Me [1]	Md [2]	*Mo* [3]	*Range*	*SD*	Me [1]	Md [2]	*Mo* [3]	*Range*	*SD*	*Z* [4]	*p*
Suicide awareness *	91	4.31	4.33	4.67	2.33–5	0.54	4.71	4.83	5	3–5	0.37	−7.12	<0.001
1. I am familiar with MATES in Construction and the work that they do.	93	4.49	5	5	1–5	0.72	-	-	-	-	-	-	-
2. Talking openly about suicide can prevent suicide.	94	4.54	5	5	1–5	0.70	4.85	5	5	4–5	0.36	−4.19	<0.001
3. If my workmate was going through a difficult time feeling upset or thinking about suicide, I think I would notice.	94	3.90	4	4	1–5	0.93	4.55	5	5	1–5	0.67	−6.05	<0.001
4. If my mate was going through a difficult time feeling upset or was thinking about suicide, I would be willing to offer help.	94	4.78	5	5	3–5	0.47	4.89	5	5	4–5	0.31	−2.52	0.01
5. If my workmate was going through a difficult time feeling upset or thinking about suicide, I would know how to connect him/her to appropriate help.	94	4.03	4	4	1–5	0.92	4.82	5	5	1–5	0.53	−6.84	<0.001
6. My current worksite supports good mental health and well-being.	91	4.32	4	5	2–5	0.79	4.62	5	5	2–5	0.63	−4.19	<0.001
7. If I was going through a difficult time, feeling upset, or was thinking about suicide, I would be willing to seek help.	94	4.29	5	5	1–5	0.89	4.59	5	5	1–5	0.75	−3.91	<0.001
Well-being													
So far today, the best way to describe how I'm feeling emotionally/mentally is …	88	4.28	4	5	2–5	0.77	4.40	5	5	2–5	0.70	−2.24	0.03

Note. * Average score of items 2–7. [1] Mean. [2] Median. [3] Mode. [4] *Z*-value is based on negative ranks.

Table 2. Help-seeking intentions: pre- and post-connectors' training.

Help-Seeking Sources	*Pre-Training*						*Post-Training*						
	N	**Me** [1]	**Md** [2]	***Mo*** [3]	***Range***	***SD***	**Me** [1]	**Md** [2]	***Mo*** [3]	***Range***	***SD***	***Z***	***p***
Intimate partner	94	4.28	5	5	1–5	.93	4.44	5	5	1–5	.93	−2.79	0.005
Close family	92	4.08	4	5	2–5	.10	4.32	5	5	2–5	.89	−3.43	0.001
Friend	94	4.00	4	5	1–5	1.02	4.27	4	5	1–5	.87	−3.50	<0.001
Workmate	94	3.40	3	3	1–5	1.14	3.85	4	5	1–5	1.05	−4.88	<0.001
Supervisor	93	2.99	3	3	1–5	1.23	3.44	3	3	1–5	1.27	−4.59	<0.001
Doctor	92	3.71	4	5	1–5	1.32	3.95	4	5	1–5	1.23	−3.66	<0.001
Mental health professional	92	3.92	4	5	1–5	1.21	4.16	5	5	1–5	1.10	−3.32	0.001
Telephone helpline	93	3.26	3	3	1–5	1.29	3.84	4	5	1–5	1.17	−5.30	<0.001
MIC Worker/Connector	91	3.87	4	4	1–5	1.01	4.42	5	5	1–5	.80	−5.75	<0.001
Minister/Religious leader	91	1.79	1	1	1–5	1.15	2.04	1	1	1–5	1.28	−3.08	0.002
Not seek help from anyone	92	1.88	1	1	1–5	1.15	1.85	1	1	1–5	1.28	−0.51 [4]	0.61
Seek help from another	71	2.39	3	1	1–5	1.33	2.38	3	1	1–5	1.31	−0.07 [4]	0.95

Note. [1] Mean. [2] Median. [3] Mode. [4] These *Z*-values are based on positive ranks, while all other *Z*-values are based on negative ranks.

3.2. Focus Grsoups and Interview Results

3.2.1. Connectors' Perspectives

Thematic analysis identified six key themes from the connectors' focus group data: awareness, skills and confidence; removing stigma; making a difference; simplicity of the model; understanding the industry; and visibility, camaraderie and passion.

Awareness, Skills and Confidence

Connectors reported being initially shocked to learn of the high suicide rates in the construction industry and of how they were previously not aware of the magnitude of the problem. They spoke of the impact of being presented with suicide statistics, and of the importance of having awareness of the issue, and in particular how learning about high construction industry suicide rates was a motivator to continue training, which in turn provided them with the skills and confidence to assist those in need.

There was positive feedback from connectors about the value of learning the skills to identify if someone is experiencing personal difficulties. Participants spoke of how connector training provided them with the confidence to be able to detect if something is wrong (e.g., listening carefully; picking up on body language and emotions) and to speak to a suicidal person and offer assistance. A number of participants indicated that prior to training, they were concerned that they did not know how to help someone in need.

> *I had very old-fashioned views about suicide and people - probably not the most supportive. The training brought me right out of that . . . and really made me realise how in general terms someone would get to a position like that and how successful help could be at the right times if people were keeping an eye out for each other.*

> *That concerned me that I didn't know what I was looking for. It made a lot of sense to me after doing the course. One of the blokes in particular was showing a lot of those symptoms that they were talking about. We could have quite easily missed it.*

Removing Stigma

Connectors discussed how that they felt their training was effective in gradually removing the stigma of suicide within the construction industry. They described how through the MATES program, talking about suicide had started to become acceptable, whereas in the past, this was seen as taboo. Several people also mentioned how it was extremely important to learn that it is beneficial, rather than dangerous to ask a potentially suicidal person if they are considering suicide.

> *We've educated people to the extent that it isn't a weakness. Everybody suffers and they go through problems. It's about solving the problem, not making it worse, and get people talking about it then and say 'do you know what, we're not bulletproof. We like to think we bloody are, but we're not'.*

> *I feel like the best part of the whole course was the removing the taboo kind of thing. I often thought that if I'm directly asking the question (are you suicidal?), it would be the wrong thing to do. I thought it would be a terrible thing because it would put it in their head and they might think about it, but I found out it's the best thing to do.*

Making a Difference

Many connectors spoke about the positive effects of knowing they had helped someone. Numerous examples were provided of how they had been able to assist others in need and provide a positive contribution to their workplace. In addition, connectors spoke about how they were able to use their MATES training to help people outside of their workplace.

Several connectors pointed out that there were times when workers were not always receptive to help-offering, although this was reported to be rare and usually the case where the worker was using

illicit drugs. It was highlighted that although MATES training emphasises that connectors should not feel guilty if unable to help someone, it would be useful to have more opportunities to 'debrief' with MATES staff and volunteers.

> *I had a member one day call me and tell me that he was thinking about jumping off a building that he was working on. I was able to go to the site and spoke with him and connected him up with some help and he got the counselling and moved forward, which was pretty powerful stuff.*

> *The fact that you are actually able to have discussions with people and they feel like you're taking an interest in them as a person... It's a two-pronged benefit. The fact that you both walk away from the situation feeling that things are in a better direction and the person's gone 'he cares about me, rather than just the name on the shirt', is the biggest benefit out of it.*

Understanding the Industry

Connectors highlighted the importance of MATES being built into the culture of the construction industry, and as such, workers can relate to and identify with MATES. This was said to be particularly the case when it comes to help-seeking. They described how, as a male-dominated industry, they found male construction workers were more comfortable talking to other workmates than calling a general helpline. They also emphasised how GAT training was 'pitched at the right level', that is, specifically for construction workers rather than for office workers, without too much focus on psychology/mental health. Connectors also spoke of how MATES was well supported within the construction industry and had united the industry in promoting the mental health of construction workers.

> *I know you've got any number of other organisations that do it, but MATES, they're a part of us. They're a part of the construction industry, so there's that connection with them. Blokes will identify with that rather than calling (a helpline).*

> *The whole thing's supported by our industry and it's something that we put together, and everyone pays into, and it's represented very well. It's taken off very well.*

Simplicity of the Model

Connectors spoke of how they liked the simplicity of the MATES model, which they said made it easy to implement and enable both help-offering and help-seeking. In addition, participants stressed another effective aspect of the MATES model was the clearly defined roles for volunteers, emphasising that they are not mental health workers nor there to 'fix' problems. Rather, MATES training provides the skills to recognise when someone needs help, and to be able to connect the person to assistance.

> *You've got your first aiders on your wall, and your mental health first aiders. They're two different people. You're going to him for a cut on the finger: well you go to him for a cut on your heart. I looked at that and I thought 'Of course. That's just so simple!'*

> *We're construction workers. We're not trained mental health professionals - we're just connectors. We'll get you from here to there and keep you safe for that bit, and then you're handing someone over to get the proper help that they need because we can't fix the problems. We can only help them get the help they need.*

Visibility, Camaraderie and Passion

Connectors stressed that MATES's high visibility on sites, as well as their passion and engagement with workers was integral to the success of MATES. They spoke of what they saw as 'a huge camaraderie around MATES' and described how representatives such as field officers were very popular with workers on site, thus making them more approachable. In general, volunteers considered that all of the above factors were integral to MATES's success.

It's the one thing that MATES have done by doing that model is with construction workers if it's in front of you, you tend to rely on it more so. The fact that the field officers are around the projects and drop in quite frequently, it's front of centre, front of mind. That reference point is always there.

They're coming from a place of—we can tell they're not just a contract trainer in to deliver something that they couldn't give two (expletives) about. It's a passion and it comes across in their delivery. People can't not pay attention when someone is delivering like that.

3.2.2. Clients' Perspectives

Three key themes were identified: barriers and pathways to help-seeking; speaking the same language; and flow-on effects.

Barriers and pathways to help-seeking

The issue of male attitudes, including traditional views such as stoicism and the importance workers place on being the 'provider' and workplace culture, were raised as key obstacles to help-seeking within the construction industry. Clients described how they (or in the case of the female interviewees, their male partners) viewed asking for help as a weakness. Several clients also highlighted their extreme reluctance to visit a doctor or health practitioner.

I know with a lot of men, particularly in that sort of industry, they've got a macho image that they're supposed to uphold. They do find it very difficult to ask for help. They think it's a weakness and people are going to judge them, which is quite sad.

[Female partner of a construction worker]

I had to learn that it's okay to admit that you're having trouble and it's okay to ask for help. That's an attitude. An attitude stopped me from doing it earlier. A change in attitude helped me get there.

When speaking about their motivations to first seek help and how they overcame barriers to help-seeking, clients echoed connectors' perspectives in terms of the importance of high visibility and promotion of MATES on construction sites, which they described as fundamental to their awareness that help was available. Significantly, several interviewees spoke of how they were able to relate to stories from MATES delegates and male peers about help-seeking experiences, which enabled them to move past traditional barriers to reach out for help.

Our delegate got up and spoke to us . . . explaining how he was in a bad situation when he was younger . . . He ended up reaching out, and if he never reached out, who knows where he would have been. I was in a really bad situation, and having someone that you look up to, talk about his own experience . . . it makes you feel a lot more comfortable. It wasn't long after that, I ended up reaching out, which was a good thing.

I went to a friend's funeral . . . we were at the wake afterwards and one of the toughest guys I've ever met spoke to me about his experience with suicidal thoughts. That was not long after the (GAT) training. I just went 'wow, so it doesn't matter how tough you are on the exterior, everyone's got feelings and emotions and if you don't deal with them, they'll deal with you'. There's people out there that can help you deal with them.

Speaking the Same Language

A strong overlap was also seen between connectors' and clients' viewpoints in their perceptions of MATES as being a part of, and thus having an understanding of the construction industry. Clients reported that MATES workers understand the problems that are unique to those working in the construction industry and that they 'speak the same language'. Also echoing the connectors, clients clearly expressed their preference to seek help from a service within the construction industry, rather than a mainstream

service provider. Clients described feeling relief in discovering that they were not alone and that others have been through similar situations. Although one client reported that it took some time to organise an appointment with a counsellor, clients in general expressed surprise that help was so easily and quickly accessible. MATES' prompt process for connecting clients to help, regular contact, and call-back and follow-up services were identified by clients as important aspects in how the MATES program had helped.

> *Just knowing that someone that you're talking to has gone through the same thing that you're going through and that you're not the only person in the world that feels that way. That gave me a big sense of relief. Those people speak your language and it becomes even more and more real and more understandable.*

> *He said 'mate, you can call this number 24 h a day'. That gave me the feeling that if I'm having trouble at that moment and I don't know, it could be three o'clock in the morning, I've got someone to call. That made me feel good. I reckon that's a real bonus. You just want someone to talk to when you're upset. I reckon that's gold.*

Flow-on Effects

Clients also spoke of their positive outcomes from receiving assistance from MATES volunteers. They also described the flow-on effects from their own experiences, such as increasing their openness to help-seeking, as well as having more awareness of other peoples' problems and openness to helping others.

> *I'm personally a lot more open these days to talking about things and I suppose reaching out to people who might be able to help if I think that's what I need; a lot more open-minded to the fact that it doesn't make you any less of a person … All that stuff—'the big tough man'.*

> *He talks highly about them (MATES), and now when he has a mate in trouble at work he always goes 'give these guys a call, even if you just need a chat'.* [Female partner of a construction worker]

4. Discussion

To the best of our knowledge, this mixed-methods study was the first to apply a qualitative approach to examine the barriers, motivations and pathways to help-seeking and help-offering in construction workers. In line with previous positive outcomes from GAT evaluation research [7], results from the connector training survey showed significant increases in connectors' self-reported suicide awareness, and willingness to both offer help to workmates and seek help themselves. It is important to note; however, that despite statistically significant increases post training, connectors' levels of suicide awareness and willingness to offer help were already quite high prior to training. This is likely due to the fact that connectors have previously undertaken GAT training and have demonstrated their willingness to help others by volunteering to be connectors. By contrast, their levels of help-seeking were lower at baseline, indicating a more obvious shift in attitudes pre- and post-training.

The connectors' focus groups provided strong support for these results; qualitatively complementing the findings with underlying reasons for how the MATES training had been effective. Connectors described how having awareness of the problem of suicide in the construction industry and learning skills and gaining confidence in how to speak to a suicidal person had motivated them to help their workmates. Connectors reported that they believed MATES training was helping to gradually reduce the stigma of suicide in the industry, which in turn was helping construction workers to understand that asking for help should not be seen as a weakness. Another important insight gained from connectors was that the simplicity of the MATES model and the clarity of their roles made it easy to implement and facilitate help-offering and help-seeking. It was important to them that their roles were not seen as mental health workers to 'fix peoples' problems' but rather to keep workers safe and connect them to help. Connectors did, however, point out that workers were not always receptive to receiving help and that more opportunities for debriefing with other volunteers would be helpful.

Results showed a significant increase in mean scores on self-reported well-being for connectors post-training. It is plausible that the awareness and confidence gained from the connector training sessions may have contributed to these feelings, as altruistic emotions and behaviours have been found to be associated with greater mental health and well-being [15,16]. This indeed appeared to be the case when connectors spoke of their positive feelings and flow-on effects when they had been able to help someone and 'make a difference'.

Qualitative data on MATES clients' perceptions and experiences also provided some extremely valuable insights into our current understanding of how the MATES program is working. Consistent with the literature on traditional masculine attitudes as barriers to help-seeking [9,10,17,18], clients spoke of how their perceptions of males needing to be self-reliant, bullet-proof, 'the provider', and viewing help-seeking as a weakness were obstacles to obtaining seeking help. Importantly, some clients described how they were able to personally overcome these barriers and, in particular, how hearing male peers speak about their own help-seeking experiences had given them the confidence to reach out for the help that they needed. In addition, clients spoke of positive outcomes since receiving assistance; their increased awareness of others' problems and increased openness to help-seeking and help-offering.

Results also indicated considerable overlap in some of the perspectives of connectors and clients. Perceptions of MATES as part of the construction industry and their high visibility on sites were considered as integral to the success of the program by both connectors and clients, demonstrating the strength of these features of the program. Importantly, the perception that MATES staff and volunteers 'speak the same language' and understand the problems that are unique to working in the industry were considered fundamental to the success of MATES by both groups.

A clear limitation of this study was the potential for selection bias in the qualitative sample. There were very few negative comments about the MATES program, and this may have been due to potential inadvertent bias of case managers and field officers in selecting participants who had positive experiences with MATES. In addition, the before-and-after training design for the connectors did not enable measurement of the long-term impact of training. The potential confounding factor of response shift bias in self-report studies [19] should also be considered, and the application of an approach such as the retrospective pretest method [20] is recommended to control for this. Future research would also benefit from randomly selected samples to ensure an accurate representation of construction workers, as well as the inclusion of follow-up connectors' data. Other recommended approaches to future research are the application of a randomised, controlled trial and comparisons between age groups on barriers to help-seeking and help-offering.

5. Conclusions

The results indicate the effectiveness of MATES connector training in improving suicide prevention awareness, and help-offering and help-seeking in connectors. It is encouraging that the program appears to be enabling workers to overcome traditional barriers and attitudes to help-seeking through the positive stories of seeking/receiving help from industry peers. These findings suggest it will be critical for MATES to continue to their focus on the peer support model, both to encourage help-seeking and offering and to continue to reduce stigma of mental health and suicide in the construction industry.

Author Contributions: V.R. developed the study design with the help of K.K. and J.G. V.R. received funding, supervised data collection and drafted the submitted manuscript with the help of K.K. and N.C. V.R. and K.K. conducted the qualitative analysis, and N.C. conducted the quantitative analysis. All authors contributed to the final version.

Funding: This research was funded by Mates in Construction.

Acknowledgments: We would like to acknowledge Dr Elizabeth Howe and Ms Lisa Kunde for conducting the focus groups and individual interviews, and Lars Gullestrup for his role in collating and managing the quantitative MATES data.

Conflicts of Interest: The authors declare no conflict of interest. Jorgen Gullestrup is employed as the Chief Executive Officer (Queensland and Northern Territory) of Mates in Construction.

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Health Promotion International, 2023, **38**, 1–15
https://doi.org/10.1093/heapro/daad082
Article

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Effectiveness of the Australian MATES in Construction Suicide Prevention Program: a systematic review

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Abstract

Suicide is a major public health issue globally. The World Health Organization has called for nations to create comprehensive national suicide prevention strategies including multisectoral collaboration, awareness raising, advocacy and capacity building. The workplace provides opportunity and structure for suicide prevention programs. However, many of these programs are poorly documented and evaluated. The MATES in Construction (MATES) program is a multimodal workplace-based suicide prevention program designed for and by the construction industry. This systematic review examined the available evidence for the effectiveness of the MATES program and is reported according to PRISMA guidelines. A literature search resulted in the inclusion of 12 peer-reviewed articles published between January 2010 and February 2023 containing primary data of evaluations of MATES. There was evidence of the effectiveness of the MATES program in improving mental health and suicide prevention literacy, helping intentions and reducing stigma. The results highlighted the importance of worker-to-worker peer approaches with workers consistently stating that supervisors were the least trusted resources for mental health and suicide concerns. Favourable results were found in relation to reduced suicide risk in the construction industry. The evidence base for MATES is limited in terms of causal inference with very few controlled evaluations and no experimental studies having been conducted to date. Improved understanding of how the program motivates volunteers, their experiences and research on the longer-term impacts of the program on the industry is required.

Keywords: suicide prevention, mental health, workplace, engaging men, public health

INTRODUCTION

The World Health Organization (WHO) has stated that suicide and suicide behaviours are a critical public health issue (WHO, 2021a). Globally more than 800,000 people die by suicide each year with suicide amongst the leading causes of death across Europe, Australia and North and Latin America (Naghavi, 2019). In developed countries, suicide rates are generally 3–4 times higher for men than for women (Chang *et al.*, 2019) and it is estimated that for every death by suicide, 10–20 individuals attempt suicide and 17% of all suicide attempts cause permanent disability (WHO, 2009).

In 2021, the WHO developed a guide for national strategies on suicide prevention, including the core pillars of multisectoral collaboration, awareness raising, advocacy and capacity building, as well as the need for scalable prevention and health promotion initiatives (WHO, 2021b). Rogers has described diffusion as the process through which an innovation is communicated through certain channels over time among members of a social system (Rogers, 2002). A significant barrier to the diffusion of preventive health innovations is that the reward for adopting preventative innovations is delayed over time and the rewards are often

Contribution to Health Promotion

- The study found some support for the MATES 'Outrage, Hope, Action' Model of engaging men in collective action preventing suicide.
- MATES demonstrates the efficacy for a focus on help offering over help seeking in male suicide prevention.
- The findings from this study have wider applications in providing health promotion to male-dominated populations.

intangible — something that is especially true for a relatively rare (but catastrophic) health event such as suicide. There are also unique complexities with scaling up some initiatives for different population subgroups. While programs that are more likely to be effective in reaching men consider both masculine norms *and* socio-cultural determinants, engage men through 'doing', use language acceptable to men, and change norms through peer engagement (Oliffe *et al.*, 2020), very few programs have been able to reach a large male audience in suicide prevention.

Workplaces are important venues for mental health and suicide prevention as they are practical settings, particularly for male-dominated groups that otherwise can be difficult to reach (Seaton *et al.*, 2019), and because employers have a duty of care to mitigate psychosocial hazards in the workplace (Potter *et al.*, 2019). Construction workers have been repeatedly identified as being at high risk of suicide, with global suicide rates amongst construction workers on average 25% higher than comparison groups (Tyler *et al.*, 2022c). The Australian construction industry employs more than 10% of the Australian workforce and is a significant contributor to the economy (ABS, 2020). Construction is highly male dominated, with 88% of workers identifying as male against an overall workforce average of 53% (ABS, 2020). Consistent with global studies, Australian construction workers have been found to have rates of suicide more than twice that of other employed men (Maheen *et al.*, 2022). Workers in the construction industry are also significantly more likely to experience psychosocial job adversity and exhibit traditional masculine norms (Tyler *et al.*, 2022a). A study of construction apprentices found that 29% of participating apprentices reported suicide ideation in the previous year (Ross *et al.*, 2022) with 31% reporting exposure to bullying in the previous 6 months, 13% reporting elevated psychological distress and 30% reporting reduced well-being (Ross *et al.*, 2021). While suicide and suicide ideation is multifaceted and will often be impacted by personal-, industry- and work-related risk factors (Tyler *et al.*, 2022b), many of the work-related risk factors for suicide have also been associated with higher risk of physical injuries at work in the construction industry (Alqahtani *et al.*, 2022). Despite the importance of workplaces in mental health and suicide risk, very few workplace-focussed mental health or suicide prevention interventions have been documented, with few evaluations of existing initiatives published in the peer reviewed or grey literature (Milner *et al.*, 2015; Seaton *et al.*, 2019; Greiner *et al.*, 2022).

The Australian program MATES in Construction, hereinafter MATES, is an example of a multisectoral collaboration raising awareness and building resilience in relation to suicide in construction workers (WHO, 2021b). MATES is a comprehensive and multimodal industry-based suicide prevention program (Martin and Gullestrup, 2014; MATES in Construction, 2020a; Neis and Neil, 2020), and is one of the few well-documented and evaluated workplace-based suicide prevention programs globally (Milner *et al.*, 2015). For a description of the program see Supplementary Material A. It is an integrated industry intervention program that raises awareness of suicide as a preventable problem, builds stronger and more resilient workers, connects workers to the most suitable available help, and finally, supports and partners with researchers to inform industry on best practice (MATES in Construction, 2020a). Originally designed as 'Men Actively Talking to Each other on Sites', MATES was set up in Queensland in 2007 in response to the documentation of elevated suicide risk in the sector compared with other Australian men (AISRAP, 2006; Heller *et al.*, 2007; Neis and Neil, 2020).

MATES has trained more than 237,359 workers in General Awareness Training (GAT) and supports a network of 21,888 'Connectors', workers volunteering to be the connection point between workers in distress and support resources and 2889 'ASIST workers', workers volunteering to be a support resource for colleagues in distress across the Australian construction industry (MATES in Construction, 2020b). MATES is noteworthy due to the program's successful diffusion amongst construction workers leading to wide dissemination in target areas (Rogers, 2002; Oliffe *et al.*, 2020). MATES uses an 'Outrage, Hope, Action' Model (LaMontagne and Shann, 2020) to engage and motivate workers. The core objective of MATES is to increase awareness and engage workers collectively in suicide prevention (Martin and Gullestrup, 2014; Neis and Neil, 2020). MATES has inspired other workplace mental health and suicide prevention programs such as the 'Blue Hats' program in Australia (Beavis, 2019), 'Mates in Mind' in England (IOSH Magazine, 2017)

and has also been extended to the mining and energy industries and the New Zealand construction industry (Little, 2019), with significant interest from several other male-dominated industries in Australia.

The MATES program logic model describes how program outputs are expected to generate program outcomes (Table 1) including improved mental health and reduced suicidality (LaMontagne and Shann, 2020). MATES is a program rolled out organically and continuously over time. In this context short-, medium- and long-term outcomes are to be understood as referring to the order of the outcomes more than a timeframe (LaMontagne and Shann, 2020). The following systematic review aimed to document available published evidence about the MATES program and assesses the evidence for overall program effectiveness.

METHODS

Approach and eligibility criteria

The systematic review for this study followed the guidelines of the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) (Liberati *et al.*, 2009). The search was conducted by Author 1 with reviewing and checking of the articles by co-authors. Co-authors included two persons who were authors of studies included in this review, plus a review co-author who was not an author or affiliated with the reviewed studies. For inclusion, studies initially had to be based on data directly relevant to the MATES program and be published in a peer-reviewed journal prior to the cut off of 31 January 2023.

Search strategy and data extraction

A literature search was conducted using the Scopus and APA PsycInfo databases and the Google Scholar search engine. The MATES research resource hub was also reviewed (MATES in Construction, 2022). A Boolean search for the term *MATES in Construction* was conducted across the first three platforms while all available records were scanned on the MATES research hub. The search was conducted on 1 February 2023. The first author screened titles and abstracts for inclusion and completed data extraction. Data from included studies were collated in a data extraction table, which included author/s, publication year, country where study conducted, study design, sample, MATES program component assessed; exposure and outcome measures and analysis methods; and results.

Data synthesis and analysis

A narrative synthesis was carried out, with a focus on documenting how these results aligned or did not align with the MATES program logic model framework (LaMontagne and Shann, 2020). The primary outcomes of interest in relation to the program logic model were impacts on mental health and suicide prevention literacy, decreased public stigma, active engagement

Table 1 List of MATES program logic model outcomes

Outcomes		
Short-term	**Medium-term**	**Long-term**
• MATES staff feel supported and satisfied. • **Increased mental health and suicide literacy and decreased public stigma.** • **Workers and volunteers play an active role in better mental health and suicide prevention, driving local activities.** • **Workers and/or family members obtain support from MATES or volunteers.** • An active coalition of representatives from industry, families, MATES staff, policy makers, other industry leaders & academics is formed with a clear mission and purpose and evidence of a commitment to meaningful activity.	• **Industry see MATES staff as honest, reliable, proactive and relationship based.** • **Improved helping behaviours.** • Increased individual and site resilience. • Improved interpersonal relationships among MATES program participants and strengthened interpersonal connections (mateship) • Workers find ways to extend MATES onsite. • Evidence of active mental health alliance across all levels in the workplace • A model framework implemented, demonstrating an industry –wide approach to mental health.	• Psychological distress in the construction industry is reduced. • **Suicide in the construction industry is reduced.** • MATES values and culture are established across industry, increasing help seeking and social connection, reducing public stigma, mandating MATES in tenders and increasing compassion in workforce … that MATES is a 'way of doing business'. • Sites are running MATES on their own. • Mental health plans are regulated across Australian workforces.

MATES Program Logic Model Outcomes
Bold text denotes that this review found relevant evaluation for the outcome.
Source (LaMontagne and Shann, 2020).

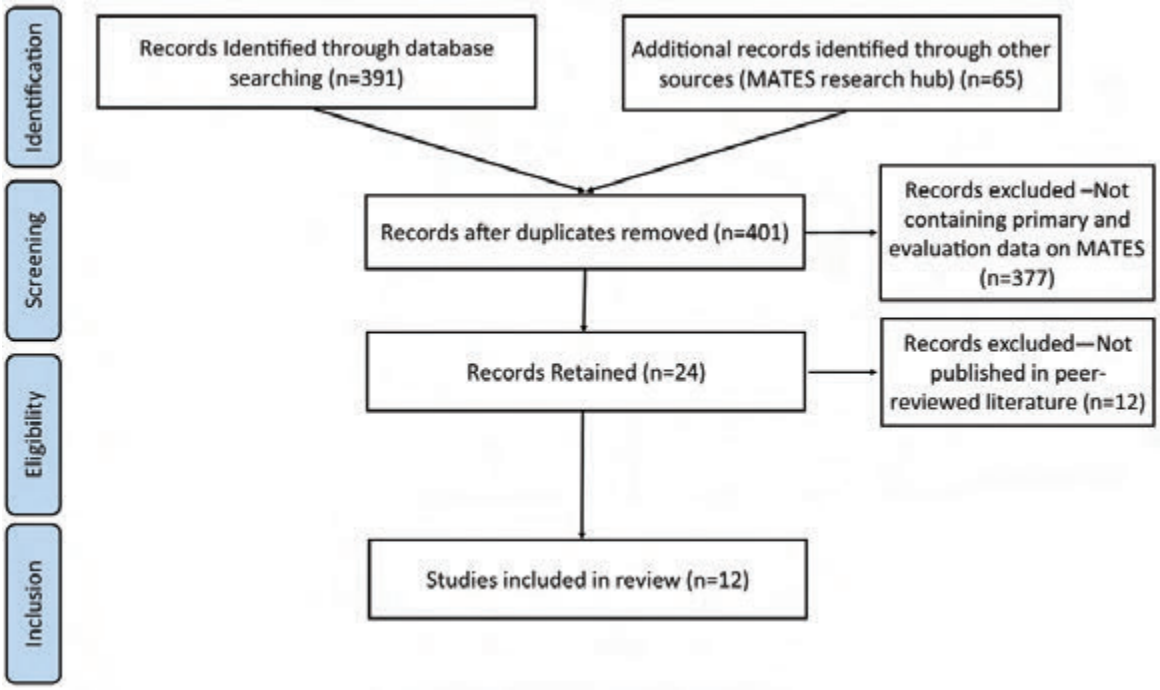

Fig. 1: PRISMA diagram revision.

of workers and volunteers in mental health and suicide prevention, increased helping behaviours and the industry's views of MATES and its role in the industry. Meta-analysis was not feasible for this systematic review given the heterogeneity in the measures and methodologies used in the included studies.

RESULTS

The searches and numbers of identified articles are summarized in Figure 1. The literature search identified a total of 456 records. After the removal of duplicates, 401 title and abstracts were screened. Of these, 24 studies were retained for full-text review whereof 12 were retained for inclusion in the systematic review, these are summarized in Table 2.

Overview of study designs and methods

Most studies (n = 9) were carried out among samples of construction workers (Gullestrup *et al.*, 2011; Doran *et al.*, 2016, 2021; Martin *et al.*, 2016; King *et al.*, 2018, 2019; Ross *et al.*, 2019, 2020a, Maheen *et al.*, 2022), two were in coal mining populations (Tynan *et al.*, 2018; Sayers *et al.*, 2019) and one was in the energy sector (Ross *et al.*, 2020b). Most (n = 7) used quantitative survey methods (Gullestrup *et al.*, 2011; King *et al.*, 2018, 2019; Tynan *et al.*, 2018; Sayers *et al.*, 2019; Ross *et al.*, 2020a, 2020b), while two were mixed method studies (Ross *et al.*, 2019; Doran *et al.*, 2021). Three articles were based solely on data from coroners' death investigations (Doran *et al.*, 2016; Martin *et al.*, 2016; Maheen *et al.*, 2022). Six studies used immediate pre- to post-training designs (Gullestrup *et al.*, 2011; King *et al.*, 2018, 2019; Tynan *et al.*, 2018; Ross *et al.*, 2019, 2020b), one study used a longitudinal design (Ross *et al.*, 2020a), while one study used a repeat cross-sectional survey (Sayers *et al.*, 2019). One study included a comparison group (Gullestrup *et al.*, 2011) but there were no experimental studies (with random assignment to intervention or comparison/control). Findings were synthesized with reference to the relevant program logic model heading. A list of program logic model outcomes with the headings used in this article highlighted is found in Table 1.

Program logic model identified short-term outcomes

1. 'Increased Mental Health and Suicide Literacy and Decreased Public Stigma'

GAT

Five studies identified statistically significant improvements in mental health and suicide prevention literacy from pre- to post-GAT (Gullestrup *et al.*, 2011; King *et*

Table 2: Summary of included studies

Author	Study type	*N*	Program logic outcome	Program elements evaluated	Results
Gullestrup *et al.* (2011)	Cross-sectional: non-equivalent group comparison	7000	Short-term	GAT, Connector, Case Management	GAT participants (n = 7000) were asked five suicide awareness questions before and five after GAT training. The same questions were asked of a comparison n = 355 group not receiving GAT training. A Mann–Whitney U test was carried out on the full sample and on a randomly selected sample of n = 355 of the intervention group compared with the comparison group. There was no significant difference between the intervention and comparison group in the five questions asked before training (Mann–Whitney p = values between 0.06 and 0.85) while both the full sample and the randomly selected sample demonstrated significantly more desirable responses after training (Mann–Whitney p = values between 0.00 and 0.01). Mean responses varied from the intervention and comparison group between 1.8% higher agreement that mental health is a work health and safety issue, 8.1% higher agreement that suicide is everyone's business and 11.7% higher agreement that most people with thoughts of suicide do not want to die. Connectors (n = 696) rated MATES very helpful (74.1%), agreed with the statement that '*MATES will work and could save lives on site*' (74.1% Strongly agree, 24.9% agree), and with the statement '*I know where and how to get help now*' (74.6% Strongly agree, 24.2% agree), Case management and crisis line had positive engagement.
Doran *et al.* (2016)	Ecological: retrospective mortality study and health Economic Evaluation	N/A	Long-term	Overall program impact	A 10% reduction in relative risk (RRR = 0.9) of suicide behaviour amongst Queensland construction workers in the 5 years after MATES implementation compared with the 5 years prior. A potential return on investment by applying the program in NSW in the same manner as in Queensland was calculated at $4.6 per $1 invested.
Martin *et al.* (2016)	Ecological: retrospective mortality study	N/A	Long-term	Overall program impact	Age Standardized Suicide Rates (ASR) amongst Qld Construction workers fell from ASR = 28.9 (per 100,000) before MATES (2003–07) to ASR = 26.7 after (2008–12), representing a 7.9% shift, while Queensland's suicide rate for all other employed males increased by 12.9% over the same period [ASR = 21.7 (2003–07) to ASR 24.5 (2008–12)]. The decrease was greatest amongst machine operators/labourers [ASR = 38.3 (2003–07) to ASR = 30.8 (2008–12), a decrease of 19.6%] while the ASR amongst skilled trades increased by 4.2% from ASR = 24.0 (2003–07) to ASR = 25.0 (2008–12). None of the changes achieved statistical significance.
Tynan *et al.* (2018)	Interventional pre–post	1277	Short-term	GAT, Connector	Significant pre- to post-training improvement in self-identified suicide prevention literacy and willingness to intervene and help a workmate following MATES in Mining GAT (n = 1163) and Connector (n = 114) training was found. Five statements about suicide prevention literacy and help offering confidence were asked and rated on a 5-point Likert scale. Ratings increased towards more desirable responses for GAT trained by between 7.4 and 13.0% and Connector trained between 15.6 and 19.2%—all at $p \leq 0.001$. Connector participants had more desirable response at pre-training compared with GAT participants between 4.6 and 19.6% across the five statements. Training was rated on a scale of 1–5 as relevant (M = 4.4; SD = 0.7) and useful (M = 4.4; SD = 0.7), satisfactorily delivered (M = 4.5; SD = 0.6) and participants would recommend the training (M = 4.5; SD = 0.7).

Table 2. Continued

Author	Study type	*N*	Program logic outcome	Program elements evaluated	Results
King *et al.* (2018)	Interventional pre–post	20,125	Short-term	GAT	A sample of five pre- and post-GAT training question on suicide prevention literacy answered by $n = 20,125$ was analysed. Answers were on a 5-point Likert scale. A sub sample of $n = 12,257$ where occupation information was known was also analysed. Participants were also asked about helping behaviours. 75.1% had known someone who died by suicide, 39.1% had sought help for themselves while 77.7% had helped someone else who were struggling. On a score from 1 to 5 participants scored a mean 3.74 (SD = 0.92) on likelihood of seeking help in the future and a mean of 4.60 (SD = 0.57) on likelihood of offering help to a mate. The sample showed significantly more desirable responses post-training compared with pre-training. There was a 16% improvement to recognition that a person with thoughts of suicide may invite others to notice, an 8.5% improvement to recognizing mental health as a safety issue and an 8.8% improvement to seeing suicide as an industry issue (all $p \leq 0.001$). Managers and Professionals had more desirable pre-training responses and larger post-training movement than lower-skilled workers such as Machinery Operators and Labourers (Recognizing invitations Managers = 21.3% vs Labourers = 13.8%, Suicide as a safety issue Managers = 11.5% vs Labourers = 6.4% and Suicide as an industry issue Professionals = 14.3% vs Labourers = 7.3%—all $p \leq 0.001$).
King *et al.* (2019)	Interventional pre–post	19,917	Short-term	GAT	Five statements were graded on a five-point Likert scale by $n = 19,917$ participants. The sample was analysed according to age and skill level of participants. Young workers scored significantly less desirable responses to questions relating to recognizing that a person with thoughts of suicide will invite other to notice (7.5% less) and believing that talking about suicide could talk suicide compared with other workers (5.2% less). Young workers were more likely to see suicide as a work safety issue (2.9% more) while there was no significant difference based on age to the statement that suicide was an industry issue. Young workers had significantly larger shifts in acknowledging that a person may send out invitations (14.9% change among 15–24 year old vs 11.1% among 45+ years old) seeing suicide as a safety issue (3.8% for those aged 15–24 years vs 3.1% for those 45+ years) and seeing suicide as an industry responsibility (15–14 years old 4% vs 45+ years old 2.8%).
Ross *et al.* (2019)	Mixed method study	104	Short-term	Connector, Case Management, Overall impact	A sample of $n = 104$ Connectors were surveyed immediately prior to and after training. Further $n = 10$ individual interviews of case management clients and focus groups of $n = 17$ was conducted. A six-item survey requiring answers on a 5-point Likert scale was used to assess suicide literacy, help seeking and help offering intentions. A question about safety in discussion of suicide showed a 6.83% ($p \leq 0.001$) shift toward a more desirable response post-training. There were also positive changes in recognition of workplace support for well-being improved 6.94% shift ($p \leq 0.001$), while more there was pre–post-training increase in those intending to seek help if in crisis (6.99%, $p \leq 0.001$). Three items inquired about help offering and also yielded positive changes—'would you notice a mate struggling' shifted by 16.67% ($p \leq 0.001$), willingness to seek help improved by 2.3% ($p = 0.01$) and knowledge of how to help connect a mate to help improved by 19.6% ($p \leq 0.001$). When rating where participants would seek support on a scale 1–5 an Intimate Partner (Mean = 4.3) was most supported followed by Close Family (Mean = 4.1), Friend (Mean = 4.0), MH Professional (Mean = 3.9), MATES Worker (Mean = 3.9), Doctor (Mean = 3.71), Workmate (Mean = 3.4), Helpline (Mean = 3.3) and the least supported was a supervisor (Mean = 0.3.0) and Minister/Religious leader (Mean = 1.8).

Table 2. Continued

Author	Study type	*N*	Program logic outcome	Program elements evaluated	Results
Sayer *et al.* (2019)	Interventional pre–post collected at baseline, 6- and 18-month follow-up	1651	Short-term	Overall program impact	Participants (n = 1651) at two mine sites were surveyed at three time points (pre-intervention, 6- and 18-month post-intervention). Three questions around perceptions of mental health stigma were asked relating to friends, workmates and employer were asked. There was significant improvement from pre- to 18 months on perception of stigma from friends (15.7% improvement, $p \leq 0.001$) and from workmates (15.1% improvement, $p = 0.01$). There was some indication that stigma from the workplace improved (16.0%), noting the p-value = 0.07. Participants were also asked to rate their most likely sources for support for a mental health crisis at each of the three time points. Family (T1 = 75.6%, T3 = 82.4%, improvement 9.0%, $p = 0.05$), Friends (T1 = 72.4%, T3 = 81.5%, improvement 12.71%, $p = 0.02$) and General Practitioner (T1 = 65.2%, T3 = 68% improvement 4.26%, $p = 0.1$) were the sources that were most highly rated. The largest shift was observed for supervisors (T1 = 25.6%, T3 = 35.2% improvement 37.5%, $p \leq 0.001$) noting that they remained lowest among all potential sources of support. Apart from supervisors, other resources improving significantly between T1 and T3 were EAP service (T1 = 30%, T3 = 49.5%, improvement 65% $p \leq 0.001$), Colleagues (T1 = 33.7%, T3 = 45%, improvement 33.53% $p \leq 0.001$) and MATES staff and volunteers (T1 = 39.2%, T3 = 46.8%, improvement 19.39% $p = 0.12$).
Ross *et al.* (2020a)	Interventional pre–post collected at baseline and 3-month follow-up	2977	Short-term	GAT, MAT	MAT participants (n = 717) and GAT participants (n = 2260) were recruited to participated in an immediate pre- and post-training survey and 3 months longitudinal follow-up. The study found no difference in results between MAT and GAT participants. The study found a significant time effect on suicide literacy at a 3-month follow-up. The only suicide literacy effect retained at follow-up was a respond to the statement '*If my mate was going through a difficult time feeling upset or thinking about suicide, I would know how to connect him/her to appropriate help*'. A mean difference of −0.38 ($p \leq 0.001$) was maintained from pre-training to 3-month follow-up. Relating to help-seeking intentions and resources, only two resources maintained improvement at 3-month follow-up being '*Mates worker/ connector*' A mean difference of −0.59 ($p \leq 0.001$) and Telephone Helpline (such as the MATES support line) at a mean difference of −0.36 ($p = 0.01$).
Ross *et al.* (2020b)	Interventional pre–post	4887	Short-term	GAT	Data were collected from GAT participants (n = 4887) in the MATES in Energy program. Participants were asked to rate 7 statements relating to suicide literacy and stigma on a five-point Likert scale. All statements demonstrated a statistically significant shift toward more desirable response post-training at the $p \leq 0.001$ level. A statement relating to willingness to offer help had the smallest improvement of 2.6% but this could be due to a ceiling effect; shifts in other items were between 6.4 and 27.2%. Furthermore, participants were asked to identify where they would seek help from if in crisis (yes/no) before (B) and after (A) training with all resources showing significant improvement: Family (B = 61.9%, A = 66.89%, 8%, difference, $p \leq 0.001$), Friend (B = 50.3%, A = 57.1%, 13.5% difference, $p \leq 0.001$), Doctor (B = 46.1%, A = 48.9%, 6% difference, $p = 0.01$) Counsellor (B = 28.4%, A = 40.1%, 41.1% difference, $p \leq 0.001$), Help Line (B = 19.4%, A = 39.02%, 101.4% difference, $p \leq 0.001$), Workmate (B = 21.7%, A = 35.2%, 62.2% difference $p \leq 0.001$), Psychologist (B = 28.9%, A = 34.7%, 20% difference, $p \leq 0.001$) and Supervisor (B = 13.9%, A = 21.5%, 55% difference, $p \leq 0.001$).

Table 2. Continued

Author	Study type	*N*	Program logic outcome	Program elements evaluated	Results
Doran *et al.* (2021)	Analysis of existing data, small exit survey	N/A	Short-term	Case Management	Demand for MATES case management had increased significantly between 2010 and 2018 (265%) with a confirmed upward trend over time (tau = 0.583, $p \leq 0.001$). Most common occupations for workers case managed were Labourers (30%), plant operators (17%) and plumbers (14%). Most common presenting issues were relationships (38%), work-related concerns (27%) and family concerns (22%). Most clients were male (92%) with a median age of 39 years of age. Most common referrals from case management were to Employee Assistance Programs (48%), counselling and well-being services (12%) and medical professionals (5%). In 25% of cases, no referrals were noted.
Maheen *et al.* (2022)	Ecological: retrospective mortality study	N/A	Long-term	Overall program impact	Age-standardized suicide rates declined significantly more amongst construction workers compared with other employed men in Australia in the period between 2001 and 2019. Over the full period there were 3995 suicides amongst construction workers (ASR = 26.6/100,000, $p \leq 0.001$) varying between ASR = 25.8 and ASR = 27.4, compared with 10,287 suicides amongst other employed men (ASR = 13.2/100,000, $p \leq 0.001$) varying between ASR = 12.9 and ASR = 13.4. An average annual percentage change (AAPC) was calculated showing an annual decrease of 3% per year for Construction workers and 1.5% decrease for other employed men. The difference was statistically significant with a pair-wise comparison showing an AAPC of 1.4% ($p \leq 0.001$).

N/A, not applicable.

al., 2018, 2019; Tynan *et al.*, 2018; Ross *et al.*, 2020b). Data collection for these studies was conducted immediately before and after the training. One study used a non-intervention group for comparison and found that while there was no difference in responses to five mental health and suicide prevention literacy questions pre-GAT between participants in training ($n = 7311$) and a comparison group ($n = 355$), there was a significant, favourable post-training improvement in responses to five questions that were not observed in the non-intervention group ($p \leq 0.01$) suggesting a positive impact of the training on mental health and suicide prevention literacy and stigma (Gullestrup *et al.*, 2011). Five other large quantitative studies ($n = 2977$ up to $n = 20,125$), using similar pre-post-survey instruments, demonstrated improvement in suicide prevention literacy and decreased stigma in pre-GAT to immediately post-GAT testing (King *et al.*, 2018, 2019; Tynan *et al.*, 2018; Ross *et al.*, 2020a, 2020b).

One study (Ross *et al.*, 2020a) used a longitudinal design to examine the consistency in outcomes between two modalities of providing mental health and suicide prevention awareness training on sites: GAT for larger sites and MAT for smaller sites. The study collected data pre-training (T1), post-training (T2) and at 3 months on-line follow-up (T3). Acknowledging the limitation of substantial loss to follow-up (T1, $n = 2977$; T3, $n = 245$) the study found that there was no significant difference between the modality of delivery (GAT vs MAT). While there was a significant improvement in suicide literacy and stigma reduction from pre- to post-training, most of this effect was lost by the 3 months follow-up. However, help-offering intention, a core objective of the MATES program, did maintain a significant improvement from T1 to T3 ($p \leq 0.001$).

Sayers et al. examined outcomes from a MATES intervention in two coal mines (Sayers *et al.*, 2019). A repeat cross-sectional survey was administered at three time points across both mines: pre-intervention (T1, $n = 649$), 6 months (T2, $n = 608$) and 18 months (T3, $n = 394$) post-GAT training. Participants showed significant improvements over the 18 months in attitudes to public- and self-stigma, disagreeing with a statement that they would be treated differently by friends (T1 = 68.3%; T2 = 68.9%; T3 = 79%; $p \leq 0.001$) or colleagues (T1 = 62.1%; T2 = 63.9%; T3 = 71.5%; $p = 0.01$) if they knew about them having a mental health condition. The same was not observed for structural stigma [referring to policies, procedures and cultural norms that restrict the opportunities of those with mental illness (Reavley, 2021) where fewer workers disagreed with the statement that their workplace would not treat them differently if it knew about them having a mental health condition and no significant

improvement was observed over time (T1 = 56.6%; T2 = 60.8%; T3 = 65.7%; $p = 0.07$).

Influence of socio-demographic characteristics on outcomes

The studies showed that the socio-demographic characteristics of participants modified the impact of training on outcomes. For example, one study of $n = 12{,}853$ participants found that white-collar workers reported better mental health and suicide prevention literacy than blue-collar workers and white-collar workers also had a greater improvement from pre- to post-training ($p < 0.001$) (King *et al.*, 2018). Two studies (King *et al.*, 2019; Ross *et al.*, 2020b) analysed the effect of age on worker responses to pre- and post-mental health and suicide prevention literacy questions. Young workers had less desirable responses to several mental health and suicide prevention literacy questions but also had a greater pre- to post-training improvement than their older colleagues (King *et al.*, 2019; Ross *et al.*, 2020b). One study showed gender differences in GAT responses amongst energy industry workers (Ross *et al.*, 2020b). At pre-training women provided significantly more desirable responses to help-seeking intentions ($p < 0.001$) while men had a significantly greater improvement from pre- to post-training responses ($p = 0.01$) (Ross *et al.*, 2020b).

Influence of lived experience on outcomes

Lived experience of suicide also appeared to influence the impact of GAT outcomes (Ross *et al.*, 2020b). A study of $n = 4788$ energy workers found that 65% knew someone who died by suicide, 70% had known someone who attempted suicide and 2% reported current or recent suicide ideation. People without lived experience of suicide loss had a more desirable change in responses relating to safety in talking about suicide ($p = 0.04$) while those who did not have lived experience of a suicide attempt had a more desirable change in responses recognizing the industry's role in suicide prevention ($p = 0.001$) (Ross *et al.*, 2020b). Lived experience of suicide ideation did not appear to impact pre- to post-training outcomes (Ross *et al.*, 2020b).

2. 'Workers and Volunteers Play an Active Role in Better Mental Health and Suicide Prevention'

Two quantitative studies focussed on the roles and experiences of MATES volunteers on sites (Gullestrup *et al.*, 2011; Ross *et al.*, 2019). One study (Gullestrup *et al.*, 2011) considered responses following Connector training ($n = 604$). After training participants agreed that they could save lives in their workplace (99%), knew where to get help and support (99%) and they felt prepared to have discussions about suicide (98%). Important for program diffusion, 99% of participants intended to tell someone about the MATES program (Gullestrup *et al.*, 2011). A second study (Ross *et al.*, 2019) conducted a pre- and post-survey on the training of 104 Connectors. Participants showed significant improved suicide awareness, help-seeking and help-offering intentions from pre- to post-training (all $p \leq 0.001$). The emotional well-being of the participants was also improved from pre- to post-training (Ross *et al.*, 2019).

A qualitative analysis (Ross *et al.*, 2019) of focus groups conducted with $n = 17$ Connectors highlighted several key themes important to understanding the role of Connectors, including findings of relevance to the MATES model of Outrage, Hope and Action. Many volunteers were motivated by the very high suicide rates in the industry (Outrage) and felt the Connector training provided them with the right awareness and skills to be confident in the role (Hope and Action). Connectors felt that it was important that MATES was an inherent part of *their industry* and *their workplace*. They found the MATES model simple to engage with and created a movement for suicide prevention by building both passion and camaraderie.

3. 'Workers and/or Family Members Obtain Support from MATES or Volunteers'

Help seeking and help offering

Four studies (Ross *et al.*, 2019, 2020a, 2020b; Sayers *et al.*, 2019) analysed workers' views on the most suitable sources for help and support. In these studies, workers were generally asked about the likelihood of seeking help or using the resources to offer help, from a pre-nominated list. Across all studies, workers were most likely to nominate informal resources such as family, friends and workmates as most useful to them. MATES-related resources such as Connectors, ASIST (Applied Suicide Intervention Skills Trained) workers, Field Officers or helplines were also likely support resources. All four studies, conducted across the construction (Ross *et al.*, 2019, 2020a), mining (Sayers *et al.*, 2019) and energy (Ross *et al.*, 2020b) industries found supervisors as the least preferred resource for help and support.

MATES training led to a significant increase in intention or likelihood of help seeking and help offering from all nominated sources from pre- to post-training (all $p \leq 0.01$). One study also found that this improvement was maintained for the MATES-related resources, MATES worker/Connector ($p < 0.001$) and Helpline ($p = 0.01$) longitudinally over 3 months (Ross *et al.*, 2020a).

Over an 18-month period post-training, a study in two coal mines showed improvements in help-seeking intentions maintained after 18 months for intentions to seek help from supervisors ($p < 0.01$), family members ($p = 0.05$), friends ($p = 0.02$), colleagues ($p < 0.01$), employee assistance programs ($p < 0.01$) and psychologists ($p = 0.04$) (Sayers *et al.*, 2019).

Case management support

Three studies analysed the MATES case management services (Gullestrup *et al.*, 2011; Ross *et al.*, 2019; Doran *et al.*, 2021). Approximately 7% of MATES participants accessed case management over a 2½ year period (Gullestrup *et al.*, 2011). A time trend analysis showed the need for case management increased with the on-site program expansion with a 265% increase in demands between 2010 and 2018 ($p < 0.001$) (Doran *et al.*, 2021). The uptake of case management support across gender and age groups were consistent with that observed amongst MATES training participants generally (King *et al.*, 2018; Ross *et al.*, 2020a). Lower-skilled trades were overrepresented as case management clients. Labourers made up 30% of clients and 25% of training participants, machine operators 17% of clients against 14% of training participants. Managers were underrepresented in case management 11% of clients against 17% of training participants (King *et al.*, 2018).

Experience of case management clients

A qualitative analysis of MATES case management client experiences was conducted through interviews with eight construction workers and two partners of clients (Ross *et al.*, 2019). Case management users reported that cultural factors, specifically the masculine culture of the industry including the importance placed on being the 'provider' and stoicism were barriers to engaging in support. Participants explained how the MATES program overcame this by being highly visible, promoted and embedded in the construction industry. It was important that the MATES program used industry-specific language and imagery, making people feel safe and confident in connecting with MATES. Having peers and industry leaders such as union delegates sharing their lived experiences of help seeking and help offering was also very important to overcoming the barriers to accessing support (Ross *et al.*, 2019).

Program logic model identified medium-term outcomes

1.'Industry see MATES staff as honest, reliable, proactive, and relationship based'

A qualitative study of Connectors highlighted the passion and engagement of the MATES staff with industry as integral to the success of MATES. The study identified a 'huge camaraderie' around the program and field staff as very popular with workers on site. This was also reflected in interviews with case management clients pointing to the importance of the peer workforce creating a feeling of MATES being part of the construction industry (Ross *et al.*, 2019).

2.'Improved Helping Behaviours'

The program logic model presumes workers play an active role in protecting and promoting mental health leading to improved helping behaviours generally. Two studies analysed referral sources for MATES case management showing a shift from help seeking towards help offering, as demonstrated by referrals changing over time from 44% of clients self-referring in 2011 falling to 22% in 2021. Referrals initiated by MATES staff and volunteers (referring to Connectors and ASIST workers) increased from 11% in 2011 to 22% in 2021, and referrals from unions increased from 14% in 2011 to 20% in 2021 (Gullestrup *et al.*, 2011; Doran *et al.*, 2021).

Program logic model identified long-term outcomes

1.'Suicide in the Construction Industry is Reduced'

Three studies (Doran *et al.*, 2016; Martin *et al.*, 2016; Maheen *et al.*, 2022) analysed suicide risk and suicide rates in the construction industry over time all based on Australian National Coronial Information System and Australian Bureau of Statistics (ABS) labour force data. Two studies analysed suicide rates in the Queensland construction industry (Doran *et al.*, 2016; Martin *et al.*, 2016), and one across the Australian construction industry (Maheen *et al.*, 2022).

One study found a non-significant reduction in suicide rates in Queensland 5 years after the introduction of the MATES program of 7.9% (T1 = 28.9/100,000; T2 = 26.7/100.000; $p = 0.386$) against a slight increase for other employed males (Martin *et al.*, 2016). Another study (Doran *et al.*, 2016) also analysing suicide rates amongst Queensland Construction workers in the 5 years pre- and post-MATES calculated a relative risk ratio of RRR = 1:0.9 suggesting a reduced risk of suicide for Queensland construction workers of 9.6% (95% CI = 9.1–10.0%) between the two periods.

A recent study (Maheen *et al.*, 2022) analysed suicide rates amongst Australian male construction workers compared with other employed men in Australia between 2001 and 2019 and calculated an annual

average percentage change in suicide rates of −3% per year for construction workers in comparison to −1.5% amongst other employed men ($p < 0.001$). The authors noted these national trends would most likely be attributable to a range of general population initiatives over this period but also construction-specific initiatives including the MATES program.

DISCUSSION

This review found evidence supporting the achievement of some outcomes identified in the MATES program logic model. Evidence was found of a positive impact on suicide prevention and mental health literacy. Some, albeit limited evidence was found of a positive impact on mental health stigma and helping behaviours over an 18-month period. Support was also found for the role of peer-focussed activities on worker empowerment and ownership of the program as important to both help offerors and help seekers. Studies examining help-seeking intentions suggested that workers had a strong preference for relational help-seeking resources (friends, family, colleagues) over employer-structured resources such as Employee Assistance Programs and supervisors or professional mental health resources. Findings also suggest that MATES led to increased help-seeking intentions from MATES-specific resources such as Connectors and the MATES helpline and that this increase was maintained over time. These findings provide some, although limited, support for the effectiveness of the MATES 'Outrage, Hope, Action' Model in engaging construction workers in suicide prevention. Finally, studies found some evidence that MATES has had a positive impact on suicide rates and relative suicide risk in the construction industry.

Previous workplace suicide prevention systematic reviews have focussed on specific industries (Bagley *et al.*, 2010; Witt *et al.*, 2017) or the field of workplace suicide prevention generally across different intervention programs (Takada and Shima, 2010; Milner *et al.*, 2015). In terms of contextualizing these results in the wider body of research, our results broadly align with other workplace suicide reviews, as detailed below.

Previous reviews of workplace programs described in the peer reviewed and grey literature found that very few programs were well articulated in the literature and even fewer evaluated (Milner *et al.*, 2015). Takada and Shima studied characteristics and effects of suicide prevention programs in workplace and other settings and found a lack of coherent strategy linking individual program elements in many suicide prevention programs (Takada and Shima, 2010). The MATES program logic model articulates the intended links between elements, enabling the program to be assessed systematically (LaMontagne and Shann, 2020). The present review is, to our knowledge, the first systematic review of the published evidence of a single multimodal workplace suicide prevention program. This narrow focus allows for a deeper understanding of how individual program components interact or impact on the overall program outcome (Takada and Shima, 2010; Milner *et al.*, 2015), and the programs potential impacts on suicide rates in the construction industry (Bagley *et al.*, 2010).

Witt *et al*. identified 13 studies evaluating suicide intervention programs targeting protective or emergency services (Witt *et al.*, 2017). Despite finding a halving of suicide rates in the included studies, a limitation identified in the study was the inability to ascribe causality in community-wide multicomponent interventions. Bagley et al. in their review of suicide prevention programs amongst military or veterans identified that multicomponent programs including education, gatekeepers, screening for individual risk as well as reduced access to means of suicide and improved access to mental health support were associated with reduced suicide rates (Bagley *et al.*, 2010). In line with these two reviews, the present review also identified significant reductions in suicide rates amongst construction workers, double that observed amongst other employed men as well as a reduced risk of suicide within the industry (Doran *et al.*, 2016; Martin *et al.*, 2016; Maheen *et al.*, 2022). Like previous reviews, this study was unable to draw a causal link between these reduced rates and the intervention. Previous studies have suggested an association between large-scale multimodal workplace suicide prevention programs and other public health benefits including reduced homicide, accidental deaths and family violence (Knox *et al.*, 2003, 2010). This is an area for further study in the MATES program context.

Witt et al. identified that most workplace programs focussed on secondary and tertiary-level prevention activities with only a few programs considering work environment factors (Witt *et al.*, 2017). The MATES program logic model described change to environmental factors as a long-term outcome of the program establishing MATES values and culture across the industry, making 'MATES a way of doing business' (LaMontagne and Shann, 2020). While this review did not find any published evidence for such a cultural shift occurring, the grey literature described a collaboration between MATES, the industry and researchers to lead cultural and environmental change in the industry. Examples of such initiatives include an industry blueprint for better mental health and suicide prevention (Milner 2017; MATES in Construction, 2018), initiatives focussing on bullying, mental health and suicidality amongst apprentices (Ross *et al.*, 2020c,

2021, 2022) and understanding distress amongst construction workers (Meurk, 2021). This aspect of the MATES program also requires further development and evaluation.

Worker engagement and collective action are central to the MATES program (LaMontagne and Shann, 2020). We found some support for the MATES 'Outrage, Hope, Action Model' of engagement in several qualitative studies (Ross, 2017; Ross *et al.*, 2019). This model is consistent with the Social Identity Model for Collective Action (Van Zomeren *et al.*, 2008) describing it as a model for mobilizing people to participate in social protest. This approach is novel in suicide prevention and may have wider application in overcoming difficulties with diffusion of preventative public health innovations (Rogers, 2002). Further research into this aspect of the MATES program may have wider implication for public health promotion in male-dominated cultures generally.

A limitation of the available evidence of the MATES program is the lack of analysis of the role of masculine norms. The impact of masculinity on suicide risk and in suicide prevention is complex and cannot be explained by lack of help seeking alone (Chandler, 2022). The gender paradox of suicide necessitate to ask not only how masculinity impacts higher suicide rates amongst men but also how it impact lower rates of suicide attempts (Canetto and Sakinofsky, 1998; Keohane and Richardson, 2018; Milner *et al.*, 2020). The MATES program draws on Kiselica and Englar-Carlson's (Kiselica and Englar-Carlson's, 2010) strength-based Positive Psychology/Positive Masculinity model with focus on help offering and peer support between men over traditional a help seeking. Further research is needed on the role of masculinity in the MATES program context.

This study highlights the complexity of the MATES program logic model, and that further research is required to fully assess the effectiveness of the MATES program. The published evidence to date was limited by the lack of experimental designs as well as a deep qualitative documentation of how the program functions on worksites. For future research, a focus on medium-term outcomes such as improvement to individual and site resilience, reduction in stigmatizing behaviours, improved interpersonal relationships, worker ownership and extensions to the MATES program on sites and the creations of cross-industry alliances for better mental health and suicide prevention is required. From a broad public health perspective, it is significant that very limited evidence exists on the effectiveness of the MATES 'Outrage, Hope, Action' Model for diffusion of the MATES program.

Strengths and limitations

This review has a number of strengths. It demonstrates the utility of an articulated MATES program logic model in framing and interpreting evaluation findings, and that further research is required to fully assess the impacts of the MATES program. It has applied a systematic approach following PRISMA guidelines to maximize transparency and reproducibility. Included studies generally had very high participation rates as data were collected as an integrated part of delivering the program, in particular the training elements of the program which target a minimum of 80% of all workers on site. This is the first review of the peer-reviewed evaluation research on the MATES program, providing a relatively detailed portrayal of a single program, complementing other reviews combining findings across workplace programs.

This review has several limitations. While restriction to peer-reviewed literature optimized the scientific quality of the included papers, this approach may also create a risk of publication bias. The variety of measures used in included studies precluded a meta-analysis, thus requiring a narrative synthesis of findings. We also note limitations in terms of generalizability, given that all included studies were conducted in Australia.

CONCLUSIONS

While the MATES program is well documented in the literature and has a published program logic model, evaluation research on the MATES program to date has focussed on near- to medium-term outcomes, often with low causal inference research designs. While the current evidence is favourable, future research should prioritize higher causal inference studies and more emphasis on longer-term outcomes. From a broader public health perspective, further evaluation of the implementation and effectiveness of the MATES 'Outrage, Hope, Action' engagement model may inform strategies for the diffusion of MATES and other suicide prevention programs.

SUPPLEMENTARY MATERIAL

Supplementary material is available at *Health Promotion International* online.

ACKNOWLEDGEMENTS

The authors would like to acknowledge the contribution of Dr Laura Cox, research manager at MATES in Construction. Dr Cox was part of the early

conceptualization of this article and also was part of reviewing early drafts of the study.

FUNDING

This work was supported by the MATES in Construction Allison Milner Memorial Scholarship fund through a PhD scholarship to JG as well as a National Health and Medical Research Council (NHMRC) 'Million Minds' Grant (APP1199972) to ADL and TK, and an Australian Research Council Discovery Early Career Research Award (DE200100607) to TK.

AUTHORS' CONTRIBUTIONS

J.G.; Conceptualization, Data Curation, Investigation, Methodology, writing original draft, reviewing and editing. T.K.; Conceptualization, Methodology, Supervision, Writing—review and editing. S.T.; Methodology, Supervision, Writing—review and editing. A.L.; Conceptualization, Methodology, Supervision, Writing—review and editing.

CONFLICT OF INTEREST STATEMENT

J.G. was employed by MATES in Construction Queensland CEO until June 2021, S.T. holds the position of Editor-in-Chief for Health Promotion International and was involved neither in the review process nor any decision-making on the manuscript and A.L. is an unpaid member of the MATES in Construction Australia Board as National Research Director.

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THE AUSTRALIAN CONSTRUCTION INDUSTRY
BLUEPRINT
FOR BETTER MENTAL HEALTH
AND SUICIDE PREVENTION

Griffith UNIVERSITY
Queensland, Australia

BLUEPRINT ROUNDTABLE

BY INDUSTRY FOR INDUSTRY

MATES IN CONSTRUCTION 2023 INDUSTRY ROUNDTABLE

SYSTEMATIC REVIEW OF THE AUSTRALIAN BUILDING AND CONSTRUCTION INDUSTRY BLUEPRINT FOR BETTER MENTAL HEALTH AND SUICIDE PREVENTION

Report submitted to MATES in Construction
by The Centre for Work, Organisation and Well-Being,
Griffith University

14.11.2023

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MATES in Construction


'Weir for life'

EXECUTIVE SUMMARY

This review aims to build a strong empirical foundation for the Blueprint for Mental Health and Suicide Prevention in the Building and Construction Industry. It involves analysing research on empirical interventions published before and after the original inception of the Blueprint in 2017 and best practices in enhancing mental health at work. Combining these sources is crucial for creating workplace mental health programs grounded in empirical evidence and characterised by forward-thinking innovation aimed at addressing a broad spectrum of issues while adhering to rigorously validated intervention theories.

In addition to building an evidence base, customisation of the resulting program during its implementation is a critical step to ensure it aligns with the unique requirements and intricacies of MATES in Construction. Synergising these strategies not only reinforces the program's underpinnings with theoretical depth, empirical validation, and practical insights but also paves the way for overcoming entrenched organisational and occupational barriers that often obstruct initiatives focused on improving employee mental health. This approach nurtures the development of a forward-looking, dynamic, and organisation-wide program and better equips it to meet the challenges of the future effectively.

The review revealed that the Blueprint Pillars Framework is strongly grounded in well-established, scientifically validated intervention theory. Furthermore, the framework has been effectively contextualised for application in the construction industry, reflecting the grass-roots nature of its development and substantial collaboration between industry and mental health experts to ensure it meets the unique needs of the construction industry. It also aligns with current scientific research and best-practice approaches for addressing mental health and suicide prevention, generally and within construction contexts.

Overall, the Blueprint Pillars Framework represents a rare, progressive, and comprehensive approach to mental health awareness and suicide prevention that transcends best-practice. Although it is strongly grounded in theory, evidence, and experience, it is also leading the way in breaking down organisational and occupational barriers that typically impede efforts to improve employee mental health by embracing a future-focused, dynamic, and industry-wide approach. This report demonstrates the strong evidence base on which the Blueprint Pillars Framework was developed and reveals why it is recognised as a leading model for enhancing mental health awareness and suicide prevention in an occupational context.

1.0 INTRODUCTION

The Blueprint Pillars Model was developed to improve the mental wellbeing of all workers within the building and construction industry (Milner & Law, 2017). Several initiatives were undertaken to establish the Blueprint Pillars Framework, drawing on multiple sources of evidence and expertise. Notably, the Construction Industry Mental Health Roundtable (September 2016) was conducted by MATES in Construction and Beyond Blue. This roundtable brought key industry stakeholders together, including representatives from construction companies, regulatory bodies, research centres, and mental health/suicide prevention organisations, to discuss the issue of suicide and mental health within the construction industry. The *Mental Health Strategy Map 2016-2021* was developed as an outcome of this event.

To support these initiatives, a report was commissioned to establish an evidence base for addressing mental health and suicide prevention in the building and construction industry (Milner & Law, 2017). This report provided a review of:

01 The burden of mental health and suicide within construction;

02 Construction work-related factors contributing to mental health and suicide that are modifiable by industry;

03 Studies evaluating construction-specific interventions addressing mental health and suicide; and,

04 Best-practice guidelines for addressing work-related mental health that apply to all work contexts, including construction.

Based on this review, the following unique stressors were identified in the blueprint: competitive and male-dominated workplace culture; stigma and fear around the subjects of mental health and suicide; ignorance of the increased risk of suicide and mental health issues for workers; failure by management to accept or apportion responsibility; higher levels of substance and alcohol misuse; disparate workplaces, FIFO (Fly in, Fly out) and DIDO (Drive in, Drive out) work; working while exposed to the elements; and, inconsistent/intermittent work. These principles informed the development of the five Blueprint Pillars:

PILLAR 1 — **PROMOTE WORK'S POSITIVE IMPACT ON MENTAL HEALTH**

PILLAR 2 — **REDUCE HARMFUL IMPACTS OF WORK**

PILLAR 3 — **PROVIDE MENTAL HEALTH AND SUICIDE PREVENTION LITERACY TO REDUCE STIGMA**

PILLAR 4 — **FACILITATE EARLY INTERVENTION AND TREATMENT**

PILLAR 5 — **PROVIDE RETURN-TO-WORK AND ONGOING SUPPORT**

Although many of the challenges outlined in the 2017 review are still found in the industry, the last six years have also seen many industry changes and new and emerging strengths and risks for mental health and suicide. This report aims to review the Blueprint Pillars for alignment with new research insights and with current global best practice guidelines and recommendations.

The report is structured as follows. First, we consider alignment between the Blueprint Pillars Framework and relevant health and intervention theories to elucidate its theoretical underpinnings. Second, we outline the methodology of a literature review of 36 empirical intervention studies conducted within the construction industry and 45 reports/papers on best-practices standards, both within and external to construction. Third, we provide insight into key findings reflecting the relevance of the Blueprint Pillars Framework with reference to current research and best-practice, highlighting recommendations and points for consideration relevant to each pillar. In the discussion and conclusion sections, we explore how the Blueprint Pillars Framework aligns with both current research and global best practice guidelines and recommendations pre- and post-2016. This analysis informs our well-considered recommendations for the framework's effective implementation.

2.0
BLUEPRINT PILLARS FRAMEWORK THEORETICAL UNDERPINNINGS

One aim of this report is to consider the extent to which the *content* of the Blueprint Pillars Framework and the *process* underpinning its development, ongoing implementation, and continual development are aligned with key intervention theories and principles. This alignment is important because the Blueprint Pillars Framework is, fundamentally, an intervention framework providing organisations with guidance for supporting workers' mental health. When designing a workplace mental health intervention, it is important to consider prominent intervention theories that provide insights into the substance of a mental health intervention (i.e., the intervention's *content*) and the recommended *processes* for ensuring its effective implementation and long-term sustainability within a specific organisational *context.*

To effectively improve workplace mental health, organisational interventions must target the root causes that enhance or impede mental health. A comprehensive understanding of these causal factors is derived from a synthesis of scientific research, subject-matter expertise, and the lived experiences of individuals within a specific occupational group or organisational context (Government of Western Australia, 2019). Established scientific theories provide a strong foundation for this undertaking, providing the intellectual framework upon which the design of an organisational intervention can be grounded (Burgess et al., 2020). This intellectual framework is further enriched by the cumulative knowledge obtained from prior research (Cox & Griffiths, 2005). Once the guiding framework is articulated, the objectives, strategies, and methods employed in interventions should be in alignment with the overarching framework (Adkins & Weiss, 2003)**.**

The *content* of the Blueprint Pillars Framework is firmly grounded in well-established scientific theory and research. The content of the Blueprint Pillars Framework refers broadly to the overall five-pillar structure of the Blueprint, as well as the specific points of focus within each of the five pillars. The five pillars each target a unique set of factors that impact mental health; together, they represent a comprehensive and multilevel framework for addressing workers' mental health. The broad, overarching structure of the framework is informed by eminent intervention theories, such as the tripartite intervention model (Murphy, 1988) and the integrated approach to workplace mental health (Lamontagne et al., 2014).

The **tripartite intervention model** (Murphy, 1988) is one of the most widely cited intervention classification systems, which differentiates between primary, secondary, and tertiary interventions. Primary interventions proactively target the root causal factors contributing to mental health, for example, minimising or eradicating harmful aspects of work. Secondary interventions encapsulate early intervention strategies that aim to enhance employees' ability to recognise symptoms of mental ill-health in themselves and others and equip them with help-seeking and help-giving skills. Secondary interventions also aim to disrupt the progression of mental ill-health resulting from stressor exposure or the presence of diagnosable disorders (Lamontagne et al., 2014). Finally, tertiary interventions are more reactive and focus on return-to-work strategies and ongoing support for workers who have experienced a mental health challenge. While the tripartite intervention model is useful for classifying strategies, it is important to note that the categories are not mutually exclusive, meaning that some strategies may fall into more than one category (e.g., resilience; Lamontagne et al., 2014). Many of the scientific studies and best-practice reports drawn on to inform the development of the Blueprint Pillars Framework reference the tripartite intervention model (e.g., Harvey et al., 2014; WorkSafe Victoria, 2007; Collins, 2014). Pillars 1, 2, and 3 reflect primary interventions, while Pillars 4 and 5 correspond with secondary and tertiary intervention strategies, respectively.

The Blueprint Pillars Framework is also informed by the **integrated approach to workplace mental health** (Lamontagne et al., 2014). This approach proposes that mental health is optimised when workplace intervention programs strive to:

(a) eliminate or reduce work-related risk factors that contribute to mental ill-health,

(b) enhance the positive aspects of work that promote mental health and develop worker strengths, and

(c) address mental health problems within the working population, irrespective of the cause, by improving mental health literacy, early intervention, and rehabilitation.

The integrative approach incorporates substantial theory and research relating to workplace mental health interventions (outlined in Lamontagne et al., 2014) and is an important basis for the Blueprint Pillars Framework. For instance, Threads 1 and 2 of the model represent a dual approach to addressing mental health espoused by eminent stress and positive psychology theories (e.g., job demands control theory, Karasek, 1979; job demands-resources theory, Demerouti et al., 2001; self-determination theory, Deci & Ryan, 2012), which are encapsulated by Pillars 1 and 2 of the Blueprint Pillars Framework. This dual approach is also emphasised in best practice models for managing workplace mental health (e.g., Collins, 2014).

Although not a specific theoretical model per se, organisational interventions are also often distinguished according to the target of the intervention. For example, Nielsen and Abildgaard (2013) distinguished between interventions targeting individuals, groups, leaders, and organisational procedures and structures. In general, individual-level interventions target employees, aiming

to modify behaviours and increase stress awareness and coping capacity skills. In contrast, organisational-level interventions target factors impacting mental health that arise from the organisation's physical or psychosocial environment (Giga, Noblet, et al., 2003). It is widely recommended that comprehensive workplace mental health intervention programs adopt a **multilevel approach**, combining individual- and organisational-level strategies encompassing the elements discussed within the tripartite model and integrative approach (Bowling et al., 2012; Cooper & Cartwright, 1997; Giga, Cooper, et al., 2003). Adopting a multilevel approach is also consistent with dominant workplace mental health intervention theory and research, which acknowledges both individual and organisational antecedents of mental health (Randall & Nielsen, 2010) and best practice guidelines for addressing workplace mental health (e.g., Harvey et al., 2014). One of the most important barriers to progression in addressing mental health is the greater proclivity for research and practice to focus on individual-level intervention (Lamontagne et al., 2007). The multilevel approach adopted within the Blueprint Pillars Framework is notable in this context.

Effective organisational interventions successfully strike a balance between being crafted in accordance with well-established scientific theories and research while being adequately contextualised to cater to the distinctive needs of the organisation, occupation, and/or industry in question (Murphy, 1988). Achieving this balance is important; organisational interventions based purely on theory and research, without adequate contextualisation, are less likely to be effective. In contrast, organisational interventions developed without adequate consideration given to rigorous scientific theory and research are similarly unlikely to demonstrate long-term effectiveness or be transferable to other workgroups beyond those involved in the interventions' initial development.

The Blueprint Pillars Framework, targeting the issue of mental health and suicide in the construction industry, successfully achieved this balance by adopting a collaborative approach to developing the Framework, drawing on the combined expertise of MATES in Construction (MATES), industry representatives, academics, and employees with lived experience of mental health within the construction industry. Since its initial development, MATES has continually engaged with industry, employees, and academics to evaluate and refine the Blueprint Pillars Framework. Participatory processes engaging multiple stakeholders ensure a more comprehensive contextual understanding of the drivers of workplace mental health; ensures that interventions are aligned with and supported by existing organisational processes and infrastructure; empowers workers by giving them a voice and builds worker and workplace capacity via skill development; and increases acceptance of interventions, all of which contribute to their ongoing effectiveness and sustainability (e.g., Lamontagne et al., 2007; World Health Organization, 2022b). The commitment demonstrated by MATES to ongoing learning and development of the Blueprint Pillars Framework is also consistent with core organisational intervention models that emphasise a continual and cyclical process of evaluation and development as part of a comprehensive approach to workplace mental health (e.g., Noblet & Lamontagne, 2009).

3.0
LITERATURE REVIEW METHODOLOGY

This section of the report presents the results of a literature review of published intervention evaluations that aim to promote mental health and suicide prevention within the construction industry.

METHOD

Articles were included in the review if they examined suicide prevention and/or mental health and wellbeing intervention programs within the building and construction industry (BCI). Searches were conducted using electronic databases: CINAHL, Cochrane Library, PubMed, OVID, Informit, Scopus, Web of Science, ProQuest Central and Dimensions. Individual searches explored all database peer-reviewed articles and reviews by combining relevant Boolean search strings to examine an article's title, abstract, keywords, and main headings for inclusion.

The following Boolean search strings were selected in line with our study aim:

- (intervention OR program OR trial OR therapy OR treatment OR support OR prevent*) AND
- ("self$harm" OR suicid* OR "attempted suicid*" OR parasuicid* OR "intentional$self$harm" OR "mental health" OR wellbeing OR "suicidal behavior") AND
- ("construction$industry" OR "construction$work*" OR "construction$professional*" OR "construction$labo*" OR "construction$workforce*" OR "construction$staff" OR "construction$personnel*" OR "construction$activit*")

The initial search initially yielded 369 peer-reviewed articles and reviews. Subsequently, a screening process where three researchers assessed the relevance of articles based on their titles and abstracts was conducted. Articles were deemed relevant if their titles and abstracts pertained to interventions promoting mental health and well-being and/or suicide prevention within the BCI. This screening procedure narrowed down the results to 146 articles that were considered relevant.

Following this screening, a comprehensive review of the content of the remaining articles was performed, paying particular attention to their literature, methodology, discussion, and other pertinent sections to ensure that each article directly addressed the objectives of the study. Through this in-depth review, it became clear that although some articles discussed mental health, well-being, and suicide interventions within the BCI, their emphasis was primarily on what could categorised as "pre-intervention" matters. These articles often focused on investigating correlations between relevant variables or recommended future interventions for the industries in question.

This comprehensive evaluation process identified 36 articles that were suitable for analysis, as they specifically addressed mental health and well-being and/or suicide prevention interventions within the BCI. In addition to our database search, 45 highly pertinent government, industry, and academic best-practice programs that addressed suicide prevention and mental health and well-being were reviewed, both within and outside the specified industries. This additional review aimed to identify further content for inclusion in the study.

RESULTS

Key Findings Relating to the Overall Blueprint Pillars Framework

Based on our review of the literature and best-practice approaches, **the content of the Blueprint Pillars Framework is highly applicable and effective as a guide for approaching mental health and suicide prevention within the building and construction industry**. Its continual utility is likely due to the strong theoretical and scientific foundations underpinning its development, the participatory approach taken to ensure its relevance within the construction industry, and the process of continual development engaged in through partnerships between MATES in Construction, stakeholders from the construction industry, and independent researchers. While the overall content and structure of the Blueprint Pillars Framework align with current scientific research and best-practice approaches for addressing mental health and suicide prevention, **there are some key factors that were identified in this review that could be emphasised to a greater extent within certain pillars.** These issues are discussed in further detail below. In addition, while the implementation of the Blueprint Pillars emphasises a dynamic process of continual improvement, **a greater focus on evaluating the impact of Blueprint Pillars on targeted outcomes (e.g., improvements in mental health and suicide prevention) is recommended to continue to demonstrate the effectiveness of the Blueprint Pillars Framework on these long-term outcomes.** This important point is also discussed in greater depth later.

PILLAR 1

PROMOTE WORK'S POSITIVE IMPACT ON MENTAL HEALTH

Pillar 1 recognises the positive impact of high-quality work, drawing on an established body of literature that demonstrates that being employed is associated with better mental health compared to being unemployed (e.g., Harvey et al., 2014; WorkSafe Victoria, 2007). Pillar 1 is also strongly grounded in the principles of positive psychology, particularly the concept of flourishing. It asserts that positive mental health is not solely the absence of harm but the *presence of opportunities for personal growth and development* (Luthans et al., 2004).

High-quality work can have a positive impact on mental health by satisfying individual needs for relatedness, competence, and autonomy (Deci & Ryan, 2012; Office of Surgeon General, 2022); developing personal resources (e.g., self-efficacy) and social resources (e.g., social support and sense of belonging; Broadbent & Papadopoulos, 2014; Comcare, 2008); and enhancing workers' sense of meaning (Office of Surgeon General, 2022). Importantly, Pillar 1 recognises there are strategies to improve the positive aspects of work that are within the control of employers; this is also in alignment with the core principles of the positive psychology discipline (Luthans et al., 2004). These include promoting a positive psychosocial environment, where team-based work and social support are enhanced, as well as increasing the meaningfulness of work by connecting employees with the outcomes of their work and through social engagement opportunities. Specific interventions outlined by MATES in Construction (2018) include:

- Policy/Planning: Maintaining good communication and promoting a collaborative workspace so that workers feel engaged in the project;
- Supervisory Staff: Getting things done by adopting a collaborative team-based approach, rather than relying on a hierarchical structure;
- Purpose of Work: Encouraging workers to focus on the benefits of the final project to enhance motivation and engagement;
- Team Building: Working with peer support networks to build teams and social cohesion around the purpose of work; and
- Surveying: Encouraging active and engaged conversation over the life of a project to highlight the good/bad periods for future management action.

Our review of the literature and best-practice reports clearly shows that Pillar 1 is well aligned with current research and practice. There are four key trends identified in our review that could be articulated to a greater extent within Pillar 1 of the Blueprint Framework:

Promoting **work-life balance**: The importance of work-life balance and assisting employees to manage non-work responsibilities, traditionally considered to be beyond the domain of the organisation, is gaining importance post-COVID-19. Supporting work-life balance is an essential component of promoting a positive, supportive work environment (e.g., Collins, 2014; Mind, 2013a; Mind, 2023c; Office of Surgeon General, 2022; Stevenson & Farmer, 2017).

Flexibility around when, where, and how to perform work is also increasingly being integrated into research and practice as a means for promoting work-life balance (e.g., Collins, 2014; Mind, 2013a; Mind, 2023c; Office of Surgeon General, 2022).

Promoting **recovery** is an important component of work-life balance and fatigue management. Encouraging workers to take breaks during shifts, psychologically detach from work when off-shift, and take leave when it is due to them are strategies to promote recovery and mental health (Health and Safety Executive, 2019).

Recent research and practice emphasise the importance of addressing mental health via the **promotion of positive, inclusive workplace cultures**. Although this is already addressed within the original Pillar 1, the focus is more on adopting team-based approaches that promote a supportive workplace culture (Campbell & Gunning, 2020). In addition to this team-based approach, recent research and practice also advocate for values-driven cultures (e.g., promoting core values of respect, gratitude, integrity, and/or trust); cultures that promote diversity and inclusion; and policies and practices consistent with a positive psychosocial safety climate (e.g., valuing people over productivity, participation, and employee voice; for example, Dollard & Bakker, 2010; Collins, 2014; Mind, 2013a; Mind, 2023b; Mind, 2023c; Office of Surgeon General. 2022; Health and Safety Executive, 2019; WorkSafe Victoria, 2021).

Harness the power of peer support networks to cultivate strong teams and promote a sense of unity around a common purpose, thereby improving overall team dynamics.

Advocate for active and engaged discussions throughout the project to identify both successful and challenging periods. This input can inform future management actions and enhance project outcomes.

PILLAR 2

HARM MITIGATION

All forms of work carry the potential for negative effects on health, and minimising harm plays a critical role in shaping mental health and well-being programs. As a result, Pillar 2 has a dual focus on

(a) reducing harmful impacts of work that contribute to stress and mental ill-health and

(b) identifying working conditions and aspects of the working environment that provide access to suicide methods.

The first category, reducing harmful impacts of work, includes chronic stressors (e.g., prolonged exposure to long work hours and excessive workloads) and acute, traumatic stressors (e.g., accidents; for example, Cedstrand et al., 2022; Carson J Spencer Foundation, 2015). MATES in Construction (2018) describe this pillar in terms of identifying and mitigating risks associated with the development or exacerbation of mental health issues in the workplace from the content of work (work-related activities), the context of work (conditions under which the activities are performed), or the culture of work (organisational values and behavioural norms). Interventions include:

- Policy Implementation: Considering both work content and work context when developing policy to foster communication and role clarity;
- Supervisory Staff: Supervisors should be trained to understand their roles and expectations;
- Peer Support: These programs can positively impact workplace culture, create clear pathways to help, and positively inform policy and supervision practices;
- Hazard Mitigation: Harmful impacts on site, such as stress, should be reduced;
- Prevention: Worksites in high-risk areas should prevent access to the site by the public to reduce suicides; and
- Connection: On remote sites (e.g., FIFO/DIDO), it is important to ensure adequate communication facilities, family-friendly rosters and peer support.

The content of Pillar 2 draws on theory and research from two established bodies of evidence:

(a) work-related stress and

(b) workplace health and safety (WHS).

It is, therefore, unsurprising that research and best-practice approaches draw on key stress theories, such as the job demands control model (Karasek, 1979) and the job demands-resources model (Demerouti et al., 2001), as well as local WHS processes for managing psychosocial hazards and risks. Due to its strong theoretical foundations, Pillar 2 of the Blueprint Pillars Framework is well aligned with current research and practice. For example, the PAW-CON, developed to assess psychosocial hazards in construction occupations under Pillar 2, is consistent with current research on lead indicators of mental ill-health, both specific to the construction industry and the general working population more broadly (e.g., CIPD, 2022; Government of Western Australia, 2019).

There are four key trends identified in current research and best-practice that could be strengthened within Pillar 2 of the Blueprint Pillars Framework:

Greater focus on **non-work-related psychosocial hazards:** Strategies aimed at reducing harmful work-related elements consider potential conflicts that work can create between professional and personal domains. This impact includes structural conflicts, which involve physical unavailability during significant non-work events, and emotional conflicts, which involve emotional exhaustion or unavailability during non-work hours. These considerations extend beyond the workplace and include factors such as sleep disruption (Carson J Spencer Foundation, 2015), fatigue (Government of Western Australia, 2019), worker accommodation conditions (Safe Work Australia, 2022), substance use/abuse (Broadbent et al., 2013; Doran et al., 2021; Gullestrup et al., 2011), relationship breakdowns, custody disputes (Broadbent et al., 2013; Doran et al., 2021; Gullestrup et al., 2011), financial stress (Broadbent et al., 2013), and legal problems (Doran et al., 2021). Although these factors may seem beyond an organisation's control, work-related strategies that help employees manage non-work-related psychosocial hazards and risks are essential for promoting better mental health. For example, Doran et al. (2021) conducted research on peer-support records (n = 4,220) and found that the most common presenting concern for those seeking peer support was relationship issues (n = 1,600), followed by work-related concerns, family concerns, and suicide concerns. Recommendations for mitigating these risks include implementing or enhancing policies for paid and unpaid leave to assist workers in addressing non-work responsibilities (Collins, 2014) and providing support for non-work responsibilities, such as parenting skills workshops or resources (Collins, 2014). The inclusion of these potential non-work-related psychosocial hazards is crucial for raising awareness of their impact on mental health, forming a vital part of risk assessments for psychosocial hazards.

Greater focus on **work-related violence, bullying, and sexual harassment**: The issue of bullying and harassment is clearly identified as a leading predictor of mental health and suicide risk across all industries. It is particularly an issue for industries that are traditionally male-dominated, as opposed to gender-balanced, where masculine values promoting toughness and stigmatising help-seeking behaviours are dominant (Campbell & Gunning, 2020; CSA Group & Bureau De Normalisation Du Quebec, 2013; Cedstrand et al., 2020; Collins, 2014; Office of the Surgeon General, 2022; Safe Work Australia, 2022; Government of Western Australia, 2019; World Health Organization, 2005, 2006; Wu et al., 2021). The Blueprint Pillars Framework does not explicitly focus on bullying and harassment; given its importance as a lead indicator of mental health and suicide (e.g., Campbell & Gunning, 2020), it would be worthwhile establishing bullying and harassment as a core focus within Pillar 2.

Greater recognition of the **mental health impacts of uncertainty**: While excessive workload is incorporated within the PAW-CON and Pillar 2, the broader issue of job uncertainty could be incorporated. Recent research and practice acknowledges that the volume and availability of construction work is unpredictable due to its transitory nature, cycles of job loss, and labour shortages. Uncertainty is a key work-related stressor for all industries but is unique in its impact on construction and FIFO/DIDO workers (Broadbent & Papadopoulos, 2014; Greiner et al., 2022; Gullestrup et al., 2011; King et al., 2018; Carson J Spencer Foundation, 2015; Office of the Surgeon General, 2022).

Remote/Isolated work: The impact of remote and isolated work is noted as a key psychosocial hazard that is applicable to all occupations and industries (CIPD, 2022; Greiner et al., 2022; Carson J Spencer Foundation, 2015; Government of Western Australia, 2019; World Health Organization, 2005, 2006). However, the issue of psychological isolation also uniquely impacts FIFO/DIDO workers, who experience isolation from their usual support systems while on-roster (due to remote work and unreliable communication systems) and while off-work because their leisure time is often out-of-sync with the daily routines of their family and friends.

PILLAR 3

MENTAL HEALTH AND SUICIDE PREVENTION LITERACY AND ENDING STIGMA

Pillar 3 of the Blueprint Pillars Framework acknowledges the important role of stigma in exacerbating mental ill-health and suicide risk within construction, reflecting the high level of stigma surrounding these issues within broader society (King et al., 2018; Harvey et al., 2014). The stigmatisation of mental health and suicide is a critical issue because it enhances feelings of shame and hopelessness, diminishes support-seeking behaviours, prolongs exposure to stressors, and intensifies feelings of isolation (e.g., King et al., 2018). Part of the stigma associated with mental health is attributed to misconceptions about mental health; these include inaccurate beliefs that full recovery from mental health injuries or illnesses is not possible, that mental health challenges reflect inherent personal weaknesses, and that experiencing work-related stress or mental health challenges means a worker is unsuitable for their job or opportunities for further development and/or promotion. The potential discrimination and social distancing arising from such misconceptions compound the suffering of the worker experiencing the effects of psychological stress, injury, or illness (CIPD, 2022; World Health Organization, 2005).

Pillar 3 emphasises the implementation of campaigns to raise awareness of mental health and suicide prevention, as well as education to improve mental health and suicide prevention literacy. Mental health and suicide prevention literacy involves knowledge of risks and protective factors, forms of support available, and where and how to access help (King et al., 2019). The importance of Pillar 3 reflects the substantial body of evidence that has demonstrated that greater awareness and education can reduce stigma and misinformation about mental health and suicide, and normalise support-seeking behaviours (e.g., Campbell & Gunning, 2021; Kime, 2021; World Health Organization, 2022b). It can also increase empathy, promote support-giving behaviours, and alleviate some of the discomfort people feel when discussing traditionally taboo topics, such as mental health and suicide (Kime, 2021). Finally, mental health literacy improves recognition of early symptoms of mental ill-health in the self and others, which increases both help-seeking and help-giving behaviours (King et al., 2019).

The stigma associated with mental health and suicide is particularly prevalent in traditionally male-dominated occupations and industries. At an individual level, research shows that males typically possess lower mental health literacy (King et al., 2019) and are less likely to engage in health promotion activities or seek help for mental health challenges (Doran et al., 2021; Greiner et al., 2022; Lingard & Turner, 2015; Milner et al., 2015); this reluctance to seek help contributes to higher rates of death by suicide for men (Broadbent & Papadopoulos, 2014). At an occupational and industry level, masculine cultural values and behavioural norms encouraging bravado, toughness, and maladaptive coping strategies (e.g., alcohol and substance abuse) perpetuate stigma and silence surrounding mental health and suicide, and research shows that both men and women in masculine cultures experience poorer mental health outcomes compared to those in gender-balanced/gender-neutral cultures (Hulls et al., 2021; Laidler, 2019). Conformity to masculine cultural values and norms, in particular, is linked to self-stigma and reluctance to seek help with mental health challenges (Milner et al., 2018). Although cultural change can be challenging, improving mental health and suicide prevention literacy, combined with supportive and aligned organisational policies and leadership practices, will shift workplace cultural values and behavioural norms that de-stigmatise mental health and suicide, and support help-seeking behaviours. Specific strategies that were recommended by MATES in Construction (2018) include:

- Information: Including a mental health awareness module in on-site health and safety inductions and providing posters and flyers on-site;
- Supervisor Training: Training supervisors in mental health and suicide prevention so they can encourage tolerance, understanding and support;
- Workforce Training: Includes training for staff, establishing a peer-based support system, conducting awareness tool-box talks and participating in awareness days;
- Diversity: Ensuring diversity to encourage the acceptance of differing ethnicities, sexual/gender orientation, mental health status and disabilities; and
- External Speaker: An industry peer speaking about their experience of poor mental health and recovery can reduce stigma and promote conversation.

Reducing the stigma associated with mental health and suicide is a key component of the Blueprint Pillars framework. Our review of current research and best-practice demonstrated that the issue of stigma is increasingly being prioritised, particularly in traditionally male-dominated industries such as construction. This issue was highlighted by Campbell and Gunning (2020), for example, who found that 52.4% of respondents from construction did not feel comfortable discussing or reporting mental health concerns, including stress and anxiety, in their organisation. Irrespective of industry, most sources included in our review mentioned the adverse impact of stigma and argued that shifting attitudes and addressing stigma is a key priority for improving mental health and preventing suicide while suggesting strategies for reducing stigma (e.g., World Health Organization, 2022b). In particular, they noted (a) the value of education and awareness in overcoming stigma and (b) the importance of aligning the organisation's cultural values and behavioural norms, policies, and leadership practices to support efforts to improve mental health and suicide prevention literacy and enable workers to openly discuss mental health-related concerns (Stevenson & Farmer, 2017).

The first broad trend to reduce stigma surrounding suicide and mental health, noted in our review, involves campaigns to increase awareness and education for stakeholders at all organisational levels, from front-line employees to executives. Specific strategies include education during inductions (Campbell & Gunning, 2021); tool-box talks on topics such as mental health, substance use/abuse, gambling, and family-related issues (Campbell & Gunning, 2021; IncoLink, 2013; Carson J Spencer Foundation, 2015); guest speakers with personal experience or professional expertise (Kime, 2021; Collins, 2014); sharing stories of hope and recovery (Spencer-Thomas, 2016; Hudson, 2016); posters and flyers (Kime, 2021); general education about mental health and/or mental health first-aid training for the entire workforce, including employees, supervisors, and leaders (Kime, 2021; Government of Western Australia, 2022; Harvey et al., 2014); utilising existing company communications (e.g., social media, newsletters, group messages; Kime, 2021; Collins, 2014); and normalising mental health and help-seeking behaviours (Carson J Spencer Foundation, 2015).

An additional interesting suggestion identified in our review is that campaigns to increase awareness of suicide prevention and mental health should not only be directed internally (to employees) but also directed externally to workers' social networks and the broader community, as the community plays an important role in supporting workers, particularly those in rural and remote areas (Hudson, 2016; Mishara & Martin, 2012; Davis et al., 2017). In their literature review, for instance, Broadbent and Papadopoulos (2014) identified that supportive social relationships play a significant role in increasing help-seeking behaviours, with encouragement from family and friends being the main impetus for men to seek professional assistance for their mental health issues. Several sources in our review noted that drawing on multiple strategies to continually reinforce mental health and suicide prevention literacy is important, as well as ensuring processes are in place to monitor and review initiatives so they remain current and effective (e.g., WorkSafe Victoria, 2021).

Stigma not only arises from a general lack of awareness and poor mental health literacy; it is also shaped by entrenched cultural values and behavioural norms. **Our review demonstrated a second clear trend: the effectiveness of educational strategies is influenced by the broader organisational culture and, specifically, whether these strategies are aligned with the organisation's policies and practices, championed by leaders, and supported by clear and open communication channels for employees to engage and report concerns.** Workplace cultural values consistent with inclusivity and a positive psychosocial safety climate would support these strategies for removing the stigma associated with mental health and suicide (e.g., Spencer-Thomas, 2016; Carson J Spencer Foundation, 2015; World Health Organization, 2022b). To assist in producing an overall culture of awareness and openness towards mental health and suicide prevention, the value of peer-supporter and leadership-supporter training was discussed by Garcia et al. (2021).

Leaders hold a crucial role in promoting a positive psychosocial safety climate that promotes mental health and suicide prevention literacy. For instance, Knox et al. (2010) discussed the importance of leadership involvement in suicide prevention in the Air Force, with regular messaging from the highest organisational levels (e.g., chief-of-staff, senior leaders, and base commanders) employed to engage the Air Force community in suicide prevention efforts. Campbell and Gunning (2020) noted that managers play an important role in reducing stigma around health and wellbeing by interacting with workers and implementing an open-door policy where workers feel safe to approach managers to share their concerns. The Canadian Standards Association (CSA Group & Bureau De Normalisation Du Quebec, 2013) and the Mental Health Commission of Canada (Collins, 2014) also discuss aspects of psychosocial safety climate, including leaders' role modelling psychosocially safe behaviours, clear communication to stakeholders about mental health and psychosocial safety to stakeholders, as well as mechanisms for incorporating input from stakeholders into policy improvements via monitoring and review processes. Adding to this last point, Suicide Prevention Australia (2020a) recommend integrating the expertise of those with lived experience in every stage of developing, implementing, and evaluating suicide prevention policies.

Leaders at all levels, therefore, require training, resources, and support to not only increase their awareness of mental health but also their skills, knowledge, and expertise in leadership, communication, and change management (Kime, 2021; Government of Western Australia, 2019, 2022; Knox et al., 2010; WorkSafe Victoria, 2021; World Health Organization, 2022b; Wu et al., 2021). For instance, UNSW & Black Dog Institute (Harvey et al., 2014) reported research demonstrating that providing managers with mental health-related training directly improved workers' mental health, while general leadership development training (e.g., transformational leadership) indirectly impacted workers' mental health by broadly improving leadership capability.

Drawing on the literature, one potential opportunity for Pillar 3 would be to specifically include the issue of **bullying and harassment** alongside mental health and suicide education. Bullying and harassment are serious stressors that attract similar levels of stigma and have the potential to cause serious harm to the individual workers involved, as well as the workgroup overall (Campbell & Gunning, 2021). In their qualitative research, Campbell and Gunning (2021) found that interviewees in their study reported bullying and harassment are common within the construction industry and recommended workplaces adopt zero-tolerance policies towards bullying and harassment and provide safe channels for reporting instances of both. In their study, they found that 34.9% of their interviewees would not feel comfortable reporting bullying or harassment in their workplaces. Wu et al. (2021) also recommended educational strategies, alongside policy and cultural change, to address toxic behaviours such as bullying, harassment, and discrimination in a timely manner.

An additional issue to consider in relation to Pillar 3 is consideration of barriers in awareness and education relating to mental health, including limited work experience (e.g., younger workers, apprentices), literacy or language issues, barriers to openly discussing safety issues (e.g., power imbalances or stigma), and lack of access to education due to part-time, contracting, or remote work (Safe Work Australia, 2022; WorkSafe Victoria, 2021).

PILLAR 4

EARLY INTERVENTION AND TREATMENT

Pillar 4 recognises that the impact of work may vary among workers, and additional support and early intervention may be needed for some workers, especially those who are vulnerable to mental health problems. In particular, Pillar 4 focuses on the benefits of early intervention for people who have pre-existing diagnosable mental health conditions and/or are already experiencing concerns about their mental health.

With its early intervention focus, Pillar 4 is distinct from the earlier Pillars: Pillar 1 focuses on enhancing the positive impact of work, Pillar 2 focuses on reducing the harmful aspects of work, and Pillar 3 aims to increase education and awareness to reduce stigma, all of which are expected to improve the mental health of most workers. These earlier Pillars (1 to 3) are more strongly aligned with the primary intervention component of the tripartite framework (Murphy, 1988), with a focus on the prevention of mental ill-health. Pillar 4, however, adopts a secondary intervention approach, acknowledging that the impacts of strategies within Pillars 1, 2, and 3 will not uniformly improve conditions for all workers; rather, those with pre-existing mental health conditions are likely to be more vulnerable and require additional support in the form of early intervention and treatment.

A fundamental aspect of Pillar 4 is that workplaces need to provide clear pathways through which workers with pre-existing conditions or concerns about mental health can be identified and provided with appropriate care. In order for early intervention to be effective, leadership actions and workplace culture and relationship dynamics need to be aligned to support honest and open communication about mental health concerns. Specific strategies recommended by MATES in Construction (2018) include:

- Policy: Non-discriminatory workplace policies that support help-seeking behaviour;
- Examples: Workers with lived experience of mental health issues or suicide who have recovered and are working successfully back in the industry can reduce barriers to help-seeking behaviour by sharing their experiences;
- Supervisor Training: Ensuring supervisors are adequately trained in symptom identification and referral pathways will increase potential access to help;
- Pathways to Help: Developing multiple pathways to diverse types of support;
- Access to EAP: Providing access to a thorough, tailored EAP for all workers on site will facilitate early intervention;
- Manager Assistance Programs (MAP): Providing line managers with access to professionals who can provide guidance on how best to support their workforce;
- Peer Support Networks: Increasing awareness of support services among staff, along with clearly visible connection points, will help workers identify clear pathways to support; and
- Onsite Interveners: Ensuring trained workers are onsite who can intervene when required.

Our literature review supports the main points of Pillar 4; perhaps the only additional aspect is the use of alternate online/web-based interventions as a means for providing early intervention for

(a) vulnerable groups,

(b) hard-to-reach groups, and

(c) isolated/remote groups and the inclusion of specific intervention strategies to align leadership actions with workplace culture and relationship dynamics (Haynes, 2017).

Managers should receive training in mental health and stress management, including how to identify signs of stress and hold supportive conversations with their staff. Regular one-to-one meetings with employees can boost engagement, build trust, and help identify issues early, allowing employees to access the support they need (Campbell & Gunning, 2020).

Notwithstanding the importance of leadership and the work environment in early detection, many workers may be reluctant to approach their employer or an independent service for mental health support (Laidler, 2019). Therefore, it is advisable to focus on building knowledge and awareness of mental health and suicide and fostering effective support among coworkers. This approach complements early detection strategies that do not rely on workers seeking help. One example is to make use of opportunities for discussions about issues that are known contributors to mental ill-health (such as physical health evaluations and discussions about rostering, remuneration, and housing). Another strategy is gatekeeper training, which equips specific groups with the skills to recognise individuals at risk of suicide and refer them to treatment or assistance (Ross et al., 2020).

Additionally, the Mates in Construction Management framework employs a brokerage model, a brief approach to case management, to help clients identify their needs and access supportive services more easily. While further research is needed to assess its effectiveness, this nonclinical, peer-based case management model, nested within a referral pathway that does not require health professional gatekeeping, represents a significant advancement in crisis care case management (Doran et al., 2021).

PILLAR 5

RETURN TO WORK AND ONGOING SUPPORT

Pillar 5 focuses on helping workers who have experienced a physical and/or psychological illness or injury to return-to-work. There are many misconceptions about mental health, including beliefs that recovery from mental health injuries or illnesses is unlikely and that mental health challenges are linked to inherent weaknesses within a worker or poor person-job fit. These misconceptions can lead to further isolation of workers and discrimination in the form of limited employment opportunities and restricted access to services and supports (CIPD, 2022; World Health Organization, 2005). Pillar 5 acknowledges that many more people who have experienced mental health illnesses or injuries would be able to participate in the workforce if effective treatment and support options were available and appropriate accommodations were made at the workplace.

Similar to Pillar 4, Pillar 5 has a different focus to the earlier Pillars (1 to 3) and is aligned with the tertiary intervention component of the Tripartite model of interventions. Therefore, Pillar 5 acknowledges that workers returning to work after experiencing a work-related injury or illness (physical and/or psychological) are likely to experience the impact of Pillars 1 to 3 on mental health differently compared to other workers and require additional support and accommodations. For example, SafeWork NSW (2021) noted that a worker returning to work after experiencing a psychological injury or illness may experience different psychosocial hazards compared to other workers and their own experience of psychosocial hazards prior to the absence. Furthermore, they may be exposed to new or different psychosocial hazards if their adjusted role differs from their previous role. MATES in Construction (2018) suggested the following interventions:

- Policy: A policy that establishes, promotes and maintains the mental health and wellbeing of all staff through work practices — and that encourages staff to take responsibility for their own mental health and wellbeing;
- Return-to-Work Support: Developing a suitable duties plan, including tasks different to a worker's usual duties. Those who work closely with the worker should be informed so they understand the change in duties and can provide support;
- Outreach to Injured Workers While Off Work: Staying in touch with them while they are away from work, calling them to find out how they are doing, inviting them to meetings or functions, and sending newsletters and announcements so they remain informed;
- Peer Support Networks: Encouraging work colleagues to keep in contact with the worker will help the worker feel like they are wanted back in the workforce; and,
- Ability Focus: Analysing the worker's current ability will help determine what a worker is capable of doing so that their work can be designed around their ability, leading to quicker recovery and return to normal duties.

Our review of current research and best-practice approaches supported the key elements of Pillar 5, and no modifications are suggested. UNSW and Black Dog Institute (Harvey et al., 2014) noted that untrue assumptions about the success of return-to-work outcomes for workers with psychological illnesses or injuries increase stigmatisation and discrimination of these workers, inhibiting their recovery. Research and practice emphasise the importance of proactively managing the return-to-work process by maintaining regular and supportive communication during absences, particularly those extending beyond two weeks (CIPD, 2022; Comcare, 2008). Clear policies regarding the nature and frequency of communication will assist in managing the expectations of this process (CIPD, 2022). The review of the research also demonstrated the importance of support initially, during the early stages of a worker's return to work, including reasonable adjustments of work, and on a longer-term basis in the form of ongoing support (CIPD, 2022; Comcare, 2008; Mind, 2013d; SafeWork NSW, 2021; Workplace Suicide Prevention & Postvention Committee, 2022; World Health Organization, 2022b). Overall principles guiding return-to-work are also recommended, including privacy, support, ownership and empowerment, and engagement of multiple stakeholders, including relevant health providers, employers, the worker, and the worker's representatives (World Health Organisation, 2022b).

4.0
SUMMARY OF RECOMMENDATIONS AND FOUNDATION FOR THE BLUEPRINT FOR BETTER MENTAL HEALTH AND SUICIDE PREVENTION

This review highlights several key considerations relevant to the Blueprint Pillars framework. Most importantly, the Framework is firmly aligned with current research and practice. Second, the Framework transcends best-practice, establishing itself as an innovative leader in addressing mental health and suicide risk because it:

Represents an industry-wide approach to addressing workplace mental health that establishes standards for all workers and workplaces within an industry. Such an approach is recommended but rarely actualised (Campbell & Gunning, 2020);

Provides a best-practice framework that has a strong scientific basis and is effectively contextualised to the industry, reflecting the varied expertise drawn on to establish the framework, including subject matter experts from industry and academia, as well as the lived experiences of employees;

Recognises that good quality work supports mental health, incorporating a dual focus on harm reduction in addition to promoting the positive aspects of work. It is clear, from the review of both literature and best practice reports, that there is still an overwhelming focus on eliminating or reducing harmful aspects of work. While this is obviously necessary, failing to recognise the positive aspects of work represents an imbalanced approach to workplace mental health; and

Reflects a comprehensive and multilevel approach to workplace mental health that addresses all stages of mental health, including a primary focus on lead indicators of mental health, as well as early intervention and return-to-work.

Notwithstanding these considerations, the review highlighted areas where the framework could be expanded or refocused. The main suggestions for improvement are:

PILLAR 1 — PROMOTE WORK'S POSITIVE IMPACT ON MENTAL HEALTH

- Promoting **work-life balance** to encourage a positive, supportive work environment;
- Promoting **recovery** and encouraging **flexibility** around when, where, and how to perform work as a means for promoting work-life balance and fatigue management; and,
- Adopting team-based approaches that promote a **positive, inclusive, and values-driven workplace culture** (promoting core values of respect, gratitude, integrity, and/or trust).

PILLAR 2 — HARM MITIGATION

- Greater focus on work-related strategies that help employees manage **non-work-related psychosocial hazards** and risks to raise awareness of their impact on mental health;
- Greater focus on work-related **violence, bullying, and sexual harassment**;
- Greater recognition of the mental health impacts of **job uncertainty**; and,
- **Provide recognition of psychological isolation** for FIFO/DIDO workers.

PILLAR 3 — MENTAL HEALTH AND SUICIDE PREVENTION LITERACY AND ENDING STIGMA

- Promote campaigns to increase awareness and education for stakeholders, including internally (employees at all levels, from front-line employees to executives) and externally to workers' social networks and the broader community for rural and remote workers;
- Adopt peer-supporter and leadership-supporter training to promote a culture of awareness and openness towards mental health and suicide prevention;

- Align educational strategies with the organisation's policies and practices and cultural values consistent with inclusivity and a positive psychosocial safety climate, championed by leaders and supported by clear and open communication channels for employees to report concerns;
- Provide leaders with training, resources, and support to not only increase their awareness of mental health but also their skills, knowledge, and expertise in leadership, communication, and change management;
- Adopt zero-tolerance policies towards bullying and harassment and provide safe channels for reporting instances of both; and,
- Identify barriers in awareness and education relating to mental health specific to the workforce, such as limited work experience, literacy or language issues, barriers to openly discussing safety issues (power imbalances or stigma), and lack of access to education due to part-time, contracting, or remote work.

PILLAR 4 EARLY INTERVENTION AND TREATMENT

- Consider alternate strategies and interventions as a means for providing early intervention for
  (a) vulnerable groups,
  (b) hard-to-reach, and
  (c) isolated/remote groups;
- Implement specific intervention strategies to align leadership actions with workplace culture and relationship dynamics; and,
- Building knowledge and awareness of mental health and suicide across all roles in the workplace and fostering effective support among co-workers, such as a gatekeeper or brokerage models to complement early detection strategies that do not rely on workers seeking help.

The final recommendation stemming from the review sits across all five pillars: the **addition of an underpinning foundation to the Framework**. Some workplace initiatives and strategies are needed to effectively implement the activities discussed under all five Blueprint pillars to promote better mental health and suicide prevention. These initiatives provide a foundation to effectively "hold up" the Blueprint Pillars framework. **This foundation combines:**

(a) leadership and organisational cultures that support employee mental health, ensuring an alignment of cultural values, policies, and practices;

(b) a participative approach involving engagement with stakeholders, especially employees at all levels;

(c) commitment to continual evaluation and improvement.

The first of these central components, **leadership**, is consistently reinforced in all best practice guidelines; for example, it is not enough to have policies in place to support staff; they need to be supported and encouraged by leadership (Kime, 2021). Internal champions who lead efforts for mental health and suicide prevention are essential, and these should ideally be managers at the highest level in an organisation (Spencer-Thomas, 2016). The importance of strong leadership and the specific activities they engage in to support mental health is documented in most of the empirical sources included in this review (e.g., CSA Group & Bureau De Normalisation Du Quebec, 2013; Hudson, 2016; CIPD, 2022; Government of Western Australia, 2022; Collins, 2014; World Health Organization, 2022b).

The critical role leaders play in mental health programs is to promote a positive, inclusive workplace culture that is values-driven (e.g., promoting core values of respect, gratitude, integrity, and/or trust); cultures that promote diversity and inclusion, and policies and practices consistent with a positive psychosocial safety climate (e.g., valuing people over productivity, participation, and employee voice; for example, Dollard, 2018; Collins, 2014; Mind, 2013a; Mind, 2013b; Minds, 2013c; Office of Surgeon General, 2022; Health and Safety Executive, 2019; WorkSafe Victoria, 2021). For instance, Knox et al. (2010) discussed the importance of leadership involvement in suicide prevention in the Air Force, with regular messaging from the highest organisational levels (e.g., chief-of-staff, senior leaders, and base commanders) employed to engage the Air Force community in suicide prevention efforts. Campbell and Gunning (2020) noted that managers play an important role in reducing stigma around health and wellbeing by interacting with workers and implementing an open-door policy where workers feel safe to approach managers to share their concerns. The Canadian Standards Association (CSA Group & Bureau De Normalisation Du Quebec, 2013) and the Mental Health Commission of Canada (Collins, 2014) also discuss aspects of the psychosocial safety climate, including leaders' role modelling psychosocially safe behaviours, clear communication to stakeholders about mental health and psychosocial safety to stakeholders, as well as mechanisms for incorporating input from stakeholders into policy improvements via monitoring and review processes.

Leaders at all levels, therefore, require training, resources, and support to not only increase their awareness of mental health but also their skills, knowledge, and expertise in leadership, communication, and change management (Kime, 2021; Government of Western Australia, 2019, 2022; Knox et al., 2010; WorkSafe Victoria, 2021; World Health Organization, 2022b; Wu et al., 2021). For instance, UNSW & Black Dog Institute (Harvey et al., 2014) reported research demonstrating that providing managers with mental health-related training directly improved workers' mental health, while general leadership development training (e.g., transformational leadership) indirectly impacted workers' mental health by broadly improving leadership capability.

The second foundation component, adopting a **participatory approach** to design programs, is consistently reinforced in all best practice guidelines and well-documented in the empirical sources included in this review. These studies emphasise the importance of input from and engagement with stakeholders at all levels internal to the workplace and, increasingly, external to the workplace. Recognition of the importance of including stakeholders external to the workplace workers' social networks and the broader community in program design, as well as consideration of potential non-work-related psychosocial hazards, is gaining importance and acceptance. The important role of communities in supporting workers has long been recognised, as having supportive social relationships can increase help-seeking behaviours, with encouragement from family and friends being the main impetus for men to seek professional assistance for their mental health issues. However, the organisation has traditionally considered extending workplace program design to include these stakeholders beyond its domain, but this view is changing post-COVID-19 when work and home domains became more blurred.

The final foundational aspect, **commitment to continual evaluation and improvement,** arises directly and indirectly from the review. Looking at direct levers, each jurisdiction in Australia provides guidance material (usually by way of a Code of Practice) on risk assessments for WHS. A key component of this involves regular risk assessments to identify foreseeable psychosocial hazards and risks, involving input from multiple stakeholders, including operational employees (Comcare, 2008; SafeWork NSW, 2021; Government of Western Australia, 2019; World Health Organization, 2022a, 2022b).

Looking at indirect levers for adopting a continuous improvement approach, there is no doubt that adopting an evidence-based, best-practice approach to workplace mental health programs is important when designing a workplace intervention program. However, it is also important to be mindful that best-practice approaches rely on evidence of what has worked effectively in the past. It takes significant time to develop, implement, and evaluate interventions that contribute to the evidence-base guiding best-practice approaches. **As a result, programs need to be continually re-evaluated to ensure they are current and relevant. It is important to ensure that this adherence to best-practice does not stifle innovation, discourage continual improvement, or produce inertia in efforts to tailor strategies to meet the current and emerging needs of the occupation or industry.**

In addition, while the implementation of most mental health programs emphasises a dynamic process of continual improvement, a greater focus on evaluating the impact of programs on targeted outcomes (e.g., improvements in mental health) is recommended to ensure that initially effective strategies maintain their positive impact over time (e.g., CSA Group & Bureau De Normalisation Du Quebec, 2013; Comcare, 2008; Government of Western Australia, 2022; Health and Safety Executive, 2019; Collins, 2014; Cousins, 2004; Safe Work Australia, 2022). As noted by Knox et al. (2010), reduction "cannot be simply maintained by virtue of a program's inherent momentum. Programmatic efforts must continuously be supported and monitored to ensure sustained effects." The review suggests numerous strategies for interventions to improve mental health, however, little is known about how these specific activities impact rates of mental health or evidence of long-term, sustained effectiveness. This observation drawn from our review represents an important challenge for mental health programs and is something that can only be addressed through long-term research partnerships between organisations, stakeholders from the relevant industries, and independent researchers and research organisations.

5.0
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Journal of Workplace Behavioral Health

ISSN: (Print) (Online) Journal homepage: www.tandfonline.com/journals/wjwb20

Supervisor relationships, peer support and mental health stressors in the Australian building and construction industry

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To cite this article: Nicholas Thompson & Christopher M. Doran (23 Feb 2024): Supervisor relationships, peer support and mental health stressors in the Australian building and construction industry, Journal of Workplace Behavioral Health, DOI: 10.1080/15555240.2024.2315139

To link to this article: https://doi.org/10.1080/15555240.2024.2315139

Published online: 23 Feb 2024.

JOURNAL OF WORKPLACE BEHAVIORAL HEALTH
https://doi.org/10.1080/15555240.2024.2315139

upervisor relationships peer support and mental health stressors in the ustralian building and construction industry

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ABSTRACT

Mates in Construction (MATES) is a multi-faceted strategy developed in Australia to address suicide prevention in the workplace. MATES operationali ed a workplace mental health framework consisting of five domains in 2019 in a move toward a broader systems-based approach to workplace mental health in the building and construction work environment. Using ob demands-resources (JD-R) theory and a revised version of the People at Work Survey (PAW-Con), the ob ective of this study is to explore workplace mental health trends within the Australian building and construction industry with the aim of identifying areas of improvement required to mitigate psychosocial ha ards at work. A quantitative method of analysis of reported ob demands and resources of 1158 construction workers was used to establish correlation and means scores within the building and construction work environment. Industry means scores enabled comparison with existing safe valid mean scores utili ing established JD-R measurements. Data was collected from construction industry workers over a twelve-month period with the findings highlighting concerns related to supervisor conflict, peer support and ob control as psychosocial ha ards requiring industry wide improvement. Fly-In Fly-Out (FIFO) and Drive-In Drive-Out (DIDO) work environments demonstrated different ha ards in procedural ustice, role ambiguity and role conflict. This study demonstrates workplace mental health issues that require attention. Targeted training of supervisors and implementation of workplace plans to address areas of identified concern will reduce rates of mental distress, harm and suicide in a high-risk industry.

ARTICLE HISTORY
Received 14 June 2023
Accepted 1 February 2024

KEYWORDS
Supervisor-employee relationship; workplace mental health; suicide prevention; stress; peer support; ob control

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Introduction

Suicide is a global public health concern with outcomes shown to be disproportionately high within certain populations (Burki, 2018; World Health Organization, 2020). Suicide rates are generally higher in men, with men who work in the construction industry at particularly elevated risk of suicide (Milner et al., 2014; Milner et al., 2013). In Australia, lower skilled trade-workers have an adjusted suicide rate of 18 per 100,000, above that of higher skilled trade-workers, who have an adjusted rate of 13 per 100,000, and of the general male population (Milner et al., 2014). Reviews of international studies have found that laborer's and cleaners have an overall increased risk of suicide, relative to the general working population, machine operators, and agricultural workers (Milner et al., 2013). Risk factors for suicide among construction industry workers include mental health problems, employment instability, workplace injury or work limiting illness, financial or legal problems, relationship breakdowns, disputes over child custody, and substance use (Milner et al., 2017; Milner et al., 2018). At the same time, and perhaps contributing to this elevated risk, men are less likely to seek help for mental health problems or suicidality (Addis & Mahalik, 2003; Berger et al., 2005; Slade et al., 2009; World Health Organisation, 2014).

This study looks to identify workplace stressors and work environment factors that have the potential to contribute to poor mental health and rates of suicide in the building and construction industry. Job demands and job control are established factors in the building and construction industry that contribute to mental ill health and distress (Chan et al., 2020). The relationship of the supervisor in this work environment is a critical component of managing job demands and resources and associated mental health impacts of the work environment. Job demands-resources (JDR) theory encapsulates most established literature attached to the work environment and stress for the building and construction industry, notably role ambiguity and poor relationships (Tijani et al., 2023). These work environment factors can and do have an impact on disclosure of mental ill health and likelihood of workers seeking support and help (Brouwers et al., 2020).

Mates in Construction (MATES) is an example of a multi-faceted strategy developed in Australia to address suicide prevention in the workplace. MATES was established in 2008 by the Building Employees Redundancy Trust to prevent suicide in the Construction Industry (Shannon, 2018). It is a multimodal non-clinical, industry led, peer based workplace suicide prevention and early intervention program, consistent with the living is for everyone strategy (Department of Health and Ageing, 2007) and Mrazek and Haggerty's spectrum of prevention and intervention (Mrazek & Rj,

1994). MATES provides a range of mental health related training, offers non-clinical case management, an out-reach service and a twenty-four-hour support service to employees of the construction industry.

Since its inception, MATES has had substantial uptake in the building and construction sector and has developed an evidence-base supporting its effectiveness (Gullestrup et al., 2023). Previous evaluation research has demonstrated the social validity of the program among construction workers (King et al., 2018), effectiveness in shifting beliefs around suicide (King et al., 2019; Ross et al., 2019), improving suicide prevention literacy, increasing intentions to offer help to workmates, and to seek help for workers themselves (Ross et al., 2020; Ross, 2017). Research has also demonstrated the significant economic return of investing in workplace suicide prevention initiatives, such as MATES (Doran et al., 2016; Kinchin & Doran, 2017).

MATES in Construction, *via* industry support and design, developed a formal peer support program based on a help offering modality, commencing in 2006 (Martin et al., 2016). This model incorporates world's best practice in suicide prevention and focuses on the strengths of construction workers willing to offer help to colleagues in distress (Ross et al., 2019). In 2016, MATES in Construction developed a Blueprint for better mental health and suicide prevention in the building and construction industry via a roundtable of representatives of workplace health and safety professionals, industry associations, employer groups, Trade Unions, Beyond Blue and academics (Milner & Law, 2017). The Blueprint is an extension of the peer support program by acknowledging that although suicide prevention is a critical component of strong workplace mental health in the construction industry, there are broader initiatives that also need to be in place to create an environment of psychosocial safety (Hutton et al., 2022).

The Blueprint framework is outlined in Figure 1 and incorporates existing evidenced workplace mental health categories grouped in three key domains: providing positive aspects of work; reducing workplace hazards; and, providing early intervention and prevention opportunities (LaMontagne et al., 2018). The Blueprint includes two additional domains, owing to the high-risk nature of the construction industry and risk profile of suicide within the construction workforce (LaMontagne et al., 2018). These domains are the provision of mental health and suicide prevention literacy and return-to-work activities. Focused suicide prevention and mental health literacy is an important component of addressing occupational suicide (King et al, 2022). Return-to-work activities and plans, although best practice and commonplace within the building and construction industry, are rarely adapted to the challenges of a mental health injury or exacerbated condition (Cullen et al., 2018). This directly impacts the

Figure 1. The five-focus model for mental health interventions in the workplace.

likelihood and perceived help seeking and help offering behavior of a work group (de Vries et al., 2018). This evidence of help seeking and help offering barriers to mental injuries or illness, therefore, has a formalized additional domain in the Blueprint framework (Milner & Law, 2017). Psychological distress from being away from the support of a work group, financial strain from limited work opportunities and collective work perceptions attached to stigma or absence from site are cumulative challenges to both disclosure and acceptance of mental health recovery in the construction environment (Baek et al., 2023). Willingness and openness to disclose mental health challenges, psychological injuries, and the need for extended periods of recovery or alternative duties are directly impacted by the culture and psychosocial environment of a work group (Brouwers et al., 2020). This creates a significant burden to workers impacted by distress or psychological injury to seek help and requires supervisors who are trusted to support and work with a person to return-to-work (Roughton et al., 2019).

Representatives from MATES in Construction use two tools to gain a picture of onsite activities and the work environment when a company or worksite endorses the Blueprint framework. The first tool is an audit survey encompassing workplace mental health activities compartmentalized into five domains. This tool asks questions about site activities related to the five domains of the Blueprint. The second tool is the People at Work – Construction tool (Loudoun et al., 2020). The People at Work – Construction (PAW-Con) gauges workers' experiences about aspects of the work environment known to be correlated with poor mental health. Representatives from companies with an organizational delegation attached to workplace mental health completed the audit tool. The two tools allow comparisons with other workplaces within the industry using industry benchmarks. These benchmarks can compare and contrast with work-groups or sites within the organization or the same workplace over time. The benchmarks are updated and expanded upon creating norms for each of the five domains when a new workgroup completes the survey. The tools enable representatives from MATES in Construction to develop a dialog with workplace health and safety representatives, project managers, site supervisors and human resource professionals about areas for a company, site or subcontractor to prioritize when developing workplace mental health initiatives.

The relationship of peers in offering support to prevent suicide is well evidenced and understood (Gullestrup et al., 2023). The relationship of supervisors as a point of support in the building and construction industry is much more complex and often identified as not being a trusted relationship to disclose suicide or mental health challenges or adversity. The nature of construction, however, is that in and amongst moving trades across building sites, trades-based workers will often have a constant point of interaction with their direct supervisor (Eyllon et al., 2020). Supervisors provide clearance and guidance and in a best practice scenario, emotional and organizational support. Imbedding psychosocial safety within this relationship is critical to improving both culture and support in the building and construction industry (Eyllon et al., 2020).

Although MATES is primarily a peer support program establishing psychological safety through community development to prevent suicide at a site level (LaMontagne & Shann, 2020), the Blueprint pillar of reducing hazards at work enables the lens to be widened to consider the impact of supervisors within this on-site network (Gullestrup et al., 2023). To this extent, the current research adds value to prior MATES-related research and compliments further information on the role of supervisors in the well-being of construction workers. Specifically, this research explores the findings from the PAW-Con undertaken by work groups from the building

and construction industry that have endorsed the Blueprint. The period of analysis is from August 2021 to August 2022. The objective of this study was to explore workplace mental health trends within the Australian building and construction industry with the aim of identifying areas of improvement required to mitigate psychosocial hazards at work. The influence and impact of supervisors to a site or company network and work environment is a contradictory focus of evidence to existing research regarding MATES due to the individuality of the relationship with a supervisor. This approach singles out one stressor or contributing factor to the work environment rather than an all of site, community development approach to suicide prevention (Sun et al., 2022). This is in contrast to the collective and community development model of existing evidence regarding MATES and the use of a peer network to prevent suicide and improve mental health (Gullestrup et al., 2023). This contradictory approach is not to take away from community development or the core program logic of MATES. This approach, however, uses the overarching Blueprint to isolate the preventing hazards pillar of the framework (Loudoun et al., 2023). This is one factor out of five, that used in tandem creates psychosocial safety at work for construction workers (Loudoun et al., 2023). Independent research outside of the MATES model of community development, that demonstrates the cause and effect of stress and mental ill health due to both the supervisor relationship and JD-R theory, is the basis of this study (Sun et al., 2022, Sommovigo et al., 2021, Lingard et al., 2022). The evidence from this study enhances, rather than contradicts the existing body of research attached to MATES and broader workplace initiatives that seek to improve mental health and suicide prevention globally in the building and construction industry (Loudoun et al., 2023).

Evidence of the construction work environment and impact of job demands and job resources on the mental health of workers is varied and diverse. Brouwers et al., 2020, used qualitative methods to look at mental health in the work environment and established the supervisor relationship as a component of both non-disclosure, stress and stigma. This study used some, however, limited narrative from construction workers (Brouwers et al., 2020). The study also used thematic analysis not including valid measures for determining workplace mental health trends. Chan et al., 2020, systematically reviewed literature attached to mental health in the construction industry and concluded that there were few studies that looked at the collective mental health or mental health stressors in the industry and asserted the need to enhance risk factor scales with valid statistical rigor. JD-R scales were identified as the dominant tool to assess mental health risk factors in the building and construction work environment to date (Chan et al., 2020). Almroth et al., 2022 used a job exposure matrix in Sweden and determined direct correlation between job control

and suicide attempts. This study was using existing statutory health data (Almroth et al., 2022). Sommovigo et al., 2021, used JD-R measures to demonstrate the impact of job control and supervisor support for tunnel workers. This study parallels Sommovigo et al., 2021, in highlighting the impact of work environmental factors on the wellbeing of the construction workforce, however, rather than focusing on one subsection or trade within the industry, surveys multiple sites and trades. Wu et al., 2019, used JD-R measures to look at job stress and burnout in Chinese construction work environments. This study explored stress and burnout and focused on role ambiguity and role conflict. The evidence demonstrates that JD-R theory can be used more strategically to look at the mental health and wellbeing of the construction industry. Sun et al., 2022, used surveys of JD-R approaches with 200 construction workers to determine an order of precedence to what psychosocial hazards can be mitigated using Bayesian network analysis to prevent mental health challenges and distress (Sun et al., 2022). Literature therefore lacks risk indicators with reliable validity separate to qualitative themes or existing statutory data to determine workplace mental health trends for construction workers. Where valid JD-R risk indicators have been used, it has been to measure stress and burnout rather than the overall factors impacting the work environment of construction workers (Chan et al., 2020). In the instance of Sun et al., 2022, the use of JD-R measures to assess priority of mental hazard mitigation was exceptionally successful, however, used a modest sample of construction workers. This study, however, paved the way for using JD-R as an approach to assist with psychosocial hazard mitigation. Sommovigo et al., 2021, similarly used a quantitative JD-R methodology, however, focused on one subsection of the industry, tunnel workers. This study seeks to broaden and increase the use of the approach with a larger more diverse sample across multiple worksites. This study also uses the Australian building and construction industry and the unique work factors of this jurisdiction to investigate workplace mental health trends and highlight areas of improvement for the building and construction industry. This builds on international examples that have used this approach with a larger more diverse sample, including FIFO and DIDO work environments.

Method

eople at work construction survey

PAW-Con is a validated measure of the work environment underpinned by the JD-R model theory (Demerouti et al., 2001; Loudoun et al., 2020). It asks questions about job demands (supervisor relationship conflict, supervisor task

conflict, role conflict, role ambiguity and role overload) and job resources (change consultation, procedural justice, praise and recognition, supervisor support, co-worker support and job control) (Ong & Johnson, 2023). The PAW-Con pivots from existing research from the Government of Australia, Safe Work Australia, WorkSafe Queensland and Beyond Blue. This original People at Work survey was extended and modified to create a survey that used culturally appropriate language attached to the building and construction industry and aspects of work unique to this psychological work environment (Loudoun et al., 2020). Examples of these aspects are the inclusion of less emotive and more practical language attached to reported emotional safety. The PAW-Con adaptation also took into consideration the nature of work in construction such as subcontractor relationships with multiple supervisors at the same time (Loudoun et al., 2020). To accommodate this, additional questions are asked, and different phrasing is used to identify a primary supervisor. The constructs were also condensed and shortened where possible to reduce the overall number of questions and time taken to complete the survey as a workgroup. This condensed version requires significantly less time to complete, which is important in an industry with heightened time pressures and focus on project deadlines and milestones. Using a combination of focus groups, pilot surveys across 11 sites and 406 individual workers, construct validity was confirmed (Loudoun et al., 2020).

The PAW-Con uses a 7-point Likert scale where a higher mean (M) score (in brackets) indicates stronger agreement that the construct (such as for example, job control or supervisor support) is part of a respondent's daily work life.

articipants

Construction industry workers were invited to complete the survey either before commencement of work or at an assigned time prescribed by the principal contractor. Participation was voluntary with information sheets explaining individual confidentiality and the noncompulsory nature of the survey. Surveys were distributed in paper format after trialing online versions with limited to no return when offered via a survey link. On average, the return for work groups with the paper survey ranged from 80 to 90% return. Individual workgroups had an allocated site contact, normally a workplace health and safety representative who, after completion of the surveys, received an aggregated report with recommendations for an improvement plan if areas of concern were identified. For the purposes of this article, the overall results of all participating sites and workers are averaged over the course of a twelve-month period.

Analysis

To establish workplace mental health trends, the aggregated responses of construction workers using the PAW-Con survey tool were used to develop correlation scores (Sun et al., 2023). This method was also used to establish correlation means within FIFO and DIDO work groups.

Results

Demographics of participating workers and work groups

PAW-Con was completed by 1,158 construction workers with 88% being male. Of these workers 71% were born in Australia and 58% had ten or more years of industry experience. Participants were employed by the principal contractor (52%), subcontractors (41%) or self-employed (2%). Employee role descriptions included tradesperson (26%), laborer (14%), other professional staff (12%), operator (11%) and leading hand/foreman (11%). The direct supervisor of participants was predominately the site manager (27%), the foreman (24%) or another manager such as a construction or project manager (15%). The sample included 364 employees (31%) from organizations using FIFO and DIDO.

Employee □b□ demands

Results for the 17-items addressing the five-employee job demands (Figure 2), suggest that, overall, participants experience high levels of supervisor task conflict ($M = 5.79$) and supervisor relationship conflict ($M = 5.83$), and lower levels of role overload ($M = 2.74$), role conflict ($M = 2.55$) and role ambiguity ($M = 1.78$).

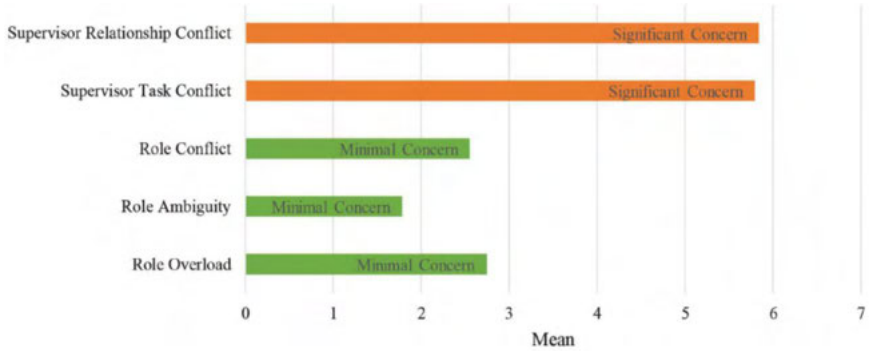

Figure □. Employee □b demands.

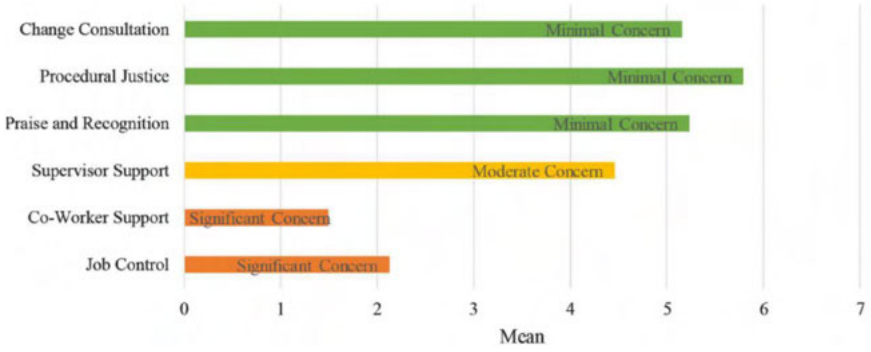

Figure 2. Employee job resources.

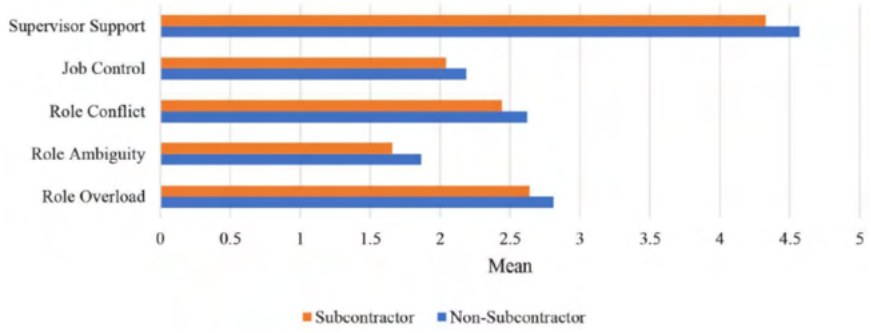

Figure 3. Differences between non-subcontractors and subcontractors.

Employee job resources

Results for the 19-items addressing the six employee job resources (Figure 3), suggest that overall, participants experience low levels of job control ($M = 2.12$), coworker support ($M = 1.49$), as well as moderate levels of supervisor support ($M = 4.46$). Participants reported receiving higher levels of praise and recognition ($M = 5.23$), procedural justice ($M = 5.79$) and change consultation. ($M = 5.15$).

Differences between non-subcontractor and subcontractors

Four-hundred and seventy participants classified themselves as working for a subcontractor (Figure 4). Subcontractors reported lower role overload (−6%), role ambiguity (−11%), and role conflict (−7%) scores compared to non-subcontractors. However, they also reported a reduction in job control (−7%) and supervisor support (−5%).

Differences between FIFO and DIDO vs non-FIFO and DIDO

Three-hundred and sixty-four participants classified themselves as working on a FIFO and DIDO worksite (Figure 5). FIFO and DIDO participants

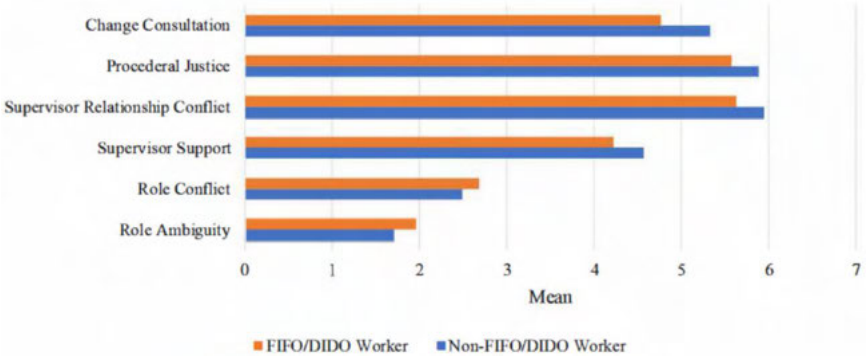

Figure 2. Differences between FIFI and DIDO and non-FIFO and DIDO.

reported 5% less supervisor relationship conflict compared to their non-FIFO and DIDO counterparts. However, FIFO and DIDO participants reported increased role ambiguity (+15%) and role conflict (+8%), as well as less supervisor support (−8%), procedural justice (−5%) and change consultation (−11%) than their non-FIFO and DIDO counterparts.

Discussion

Supervisor relationship and task conflict within the building and construction industry can have numerous complexities. Identifying a direct supervisor within the environment of subcontractors and project management presents unique industry-based challenges (Lingard et al., 2019). Trade roles and responsibilities at differing points of a project build, add to the complexity of relationship and task conflict and high-pressured environments (Oswald & Lingard, 2019). The objective of this study was to explore workplace mental health trends within the Australian building and construction industry with the aim of identifying areas of improvement required to mitigate psychosocial hazards at work. Aggregated data suggests there is significant work to be done in improving both supervisory relationships and task conflict across the industry. Job control, similarly, requires industry wide attention. While high risk and safety orientated, autonomy and choice directed work can be a part of work design in the building and construction industry (Sommovigo et al., 2021) developing the overall psycho-social safety of the construction workforce requires deliberate strategic intervention to model effective supervisor relationships. These relationships need to embed psycho-social safety to be able to communicate complex shared work tasks with a collaborative solution focused outcome of mutual benefit and understanding (Lingard et al., 2022). The supervisor worker relationship, in particular conflict, alongside with job control directly impacts the mental health of workers (Milner et al., 2018). Deterioration of mental health, while not predictive of suicide ideation, can be a

contributing factor to suicide ideation and a common attribute of ongoing supervisor conflict and lack of job control (Virtanen, 2018).

eer support and mental health at work

All sites that formally endorse the Blueprint have some level of MATES in Construction engagement; this includes all participants in this study. This endorsement usually involves engagement with trained peer-to-peer connectors and applied suicide intervention trained professionals and site awareness training around suicide prevention and workplace mental health to improve suicide awareness and preparedness to assist (LaMontagne & Shann, 2020). Engagement with a view to accreditation varied by individual work cohort, however, with any combination of these three best practice initiatives having taken place. These variations included:

1. Initial engagement to arrange these workplace activities, without broad community development at a site level having taken place, but a desire of the worksite to enhance the wellbeing of the workforce.
2. Activities having taken place, however, only general awareness.
3. Full accreditation to the MATES program involving all workers undergoing general awareness, a percentage of peer-to-peer trained connectors who can link workers into support as required and at least one Applied Suicide Intervention Skills trained resource to guide workers with thoughts of suicide to safety.

Perceived coworker support, however, was at concerning rates irrespective of engagement with MATES in Construction or the trajectory of the applied program logic and engagement. The coworker support was of concern even amongst a majority of engaged sites with community development principles around suicide prevention live and in action. Existing evaluation of peer-to peer support demonstrated strong perceptions of work-related support and care (Ross et al., 2019). Ongoing maintenance of awareness and psychosocial education around help offering and peer support requires site-based focus and full ongoing accreditation of the program logic to create cultural change in the building and construction industry (LaMontagne & Shann, 2020).

Creating psychosocial safety at work through leadership development

Key initial objectives attached to these findings include the need for tailored supervisor training for the building and construction industry. The presumption that trades-based professionals automatically have the capacity

to understand the nuances of effective supervisor relationships from the duration or experience in the industry, fails to consider the complexity of the construction industry or the complexity of the supervisor's role in a high-risk, high-pressured environment. This is of particular importance to return-to-work activities where the supervisory relationship is critical to recovery. This includes but is not limited to working with support services such as clinical and medical professionals, managing alternate duties and maintaining peer connection with the team. These activities are critical to recovery and without a strong supervisory relationship are fraught with challenges. Peer led, help offering programs that are culturally appropriate to the work environment of building and construction, similarly require additional advocacy and take up, to enhance the wellbeing of construction workers at significant occupational risk to suicide. This will develop a site-based community able to respond to the mental health and wellbeing needs of its network irrespective of the perceived peer support of individuals.

Limitations

Limitations of this study require recognition. These relate to the overall sample in an industry far larger in scale than the aggregated data. The diversity of participation, however, spans a twelve-month period without repeat workplace cohorts engaging in the survey and of a statistically large sample by research standards. Another limitation is external factors that may have influenced the results but are not related to the work environment, such as project delays, COVID-19 social restrictions and unprecedented shortages of key workforce personal and materials. This data provides a snapshot in time related to some of the known stressors across the building and construction industry. A larger, more diverse sample would allow examination of subgroups within the industry such as individual trades and subcontractor worker responses contrasted with principal contractor workers responses and enhance broader understanding of key trends in the industry and areas of focus for workplace mental health initiatives. Exploration of peer support as reported through this data would be enhanced if engagement with peer-to-peer programs could be isolated into sub sections. These subsections as per best practice are, initial engagement with program, ongoing psychosocial and general awareness of suicide risk and help offering, fully accredited with peer-to-peer program (LaMontagne & Shann, 2020). This study uses only quantitative analysis. Qualitative themes of experiences of workers and their job demands and resources including impacts on mental health would enhance perspectives from the sample of workers within this or future studies.

Conclusion

The findings of this study demonstrate that job control and coworker support in the building and construction environment were of significant concern and impacting the mental health and wellbeing of workers. Supervisor support was of moderate concern, supervisor task conflict and supervisor relationship conflict were of significant concern including in FIFO and DIDO work environments. Workplace mental health trends *via* this cohort of construction workers indicate that the supervisory to employee relationship is challenging and requires focus and commitment to enhance at an industry wide level. This is of increased importance due to the rates of suicide for construction workers and the clear impact of stress attached to this relationship as a psychosocial hazard. For FIFO andDIDO environments this is somewhat different in that procedural justice and role conflict requires additional support and industry attention. These FIFO and DIDO specific hazards still rely heavily on the supervisory relationship to improve. Overall job demands and resources across the industry point to a significant need to improve the mental health of a high-risk industry with concerningly high rates of occupational suicide. These rates are clearly impacted by stress and mental health challenges that stem from the work environment and factors attached to site-based relationships and industry culture.

Analysis of workgroups perceptions of peer support based on the levels of take up of the MATES in construction program, particularly comparing limited engagement with a peer support program, to somewhat of a peer support program, to full site accreditation, requires further research to determine what factors are required in the building and construction work environment to improve peer relationships and reduce perceptions of isolation. With peer support evidenced as one of the most effective components of suicide prevention, this research is of significant priority for the high-risk profile of the building and construction industry. Targeted training of supervisors as identified in this sample requires further interrogation for the building and construction industry. This study warrants evidenced research on what is required for supervisors to effectively support and enhance the wellbeing of their teams and mitigate reported psychosocial hazards, particularly supervisor conflict. This research needs to look at existing evidence in supervisory training programs, skills development and organizational work design that support supervisors and their relationship impacts. This research also requires the qualitative needs of supervisors in multiple, diverse, changing construction environments spanning the life cycle of sites. This needs to include multiple trades, subcontracting arrangements, and roles. Evidence where a site or company has implemented strategies and programs to address these workplace hazards in an effective way,

is also required to give best practice scenarios and case studies to the industry of workplace health and safety initiatives that have successfully implemented measures to mitigate psychosocial hazards. The overall trends attached to mental health of the Australian building and construction industry are influenced by the job demands and resources of the construction environment as evidenced by the 1158 construction workers who participated in the People at Work - Construction Survey. These trends across the Australian building and construction industry require consistent monitoring and focus to improve the collective wellbeing of the industry and reduce the high rates of occupational suicide.

Acknowledgements

The authors would like to acknowledge Associate Professor Rebecca Loudoun and the Centre for Work, Organization and Wellbeing at Griffith University for contribution to data collection.

Ethical approval

Ethics approval provided from Central Queensland University Human Research Ethics Committee (Application reference 24218).

Author contributions

NT conceived and developed the research. CD assisted in ethical clearance and manuscript preparation. All authors contributed to drafting of the manuscript and revising it for important intellectual content. All authors gave approval of the final version.

Disclosure statement

NT is the CEO of MATES in Construction (Queensland). CD has previously received project funding from MATES in Construction. No potential conflict of interest was reported by the author(s).

Funding

Supported by funding from MATES in Construction (Queensland). The study sponsor provided access to participants through its network but had no role in study design, analysis and interpretation.

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Data availability statement

Data extracted and analyzed in this study can be made available from the corresponding author upon reasonable request and within constraints of ethical clearance.

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Journal of Workplace Behavioral Health

ISSN: (Print) (Online) Journal homepage: www.tandfonline.com/journals/wjwb20

The concept of distress – widely used but what does it mean for individuals working in the construction industry?

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To cite this article: Lisa Wittenhagen, Jorgen Gullestrup, Chris M. Doran, Rachel Brimelow, Nicholas Thompson, Edward Heffernan & Carla S. Meurk (18 Jul 2024): The concept of distress – widely used but what does it mean for individuals working in the construction industry?, Journal of Workplace Behavioral Health, DOI: 10.1080/15555240.2024.2356799

To link to this article: https://doi.org/10.1080/15555240.2024.2356799

Published online: 18 Jul 2024.

JOURNAL OF WORKPLACE BEHAVIORAL HEALTH
https://doi.org/10.1080/15555240.2024.2356799

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The concept of distress – widely used but what does it mean for individuals working in the construction industry?

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ABSTRACT

Distress is a frequently used concept, conveying a variety of meanings. Clear definitions are needed to promote common understanding, effective communication, and the development of solutions. One occupation in which workers disproportionately report distress is the construction industry. To implement effective models of care, a construction industry specific definition of distress is needed. Face-to-face consultations, qualitative interviews and a voluntary follow-up online survey were conducted with a purposively derived sample of construction industry stakeholders from across Australia (Total $N = 56$). Based on qualitative analysis of content and themes, we developed and tested a definition of distress as: "an emotional state in which individuals feel that they are not in control, overwhelmed, or are unable to cope." Findings highlight that distress is a complex issue that can have both personal and work-related causes. Workplace culture, awareness and trust are critical factors in creating a safe environment and supporting individuals who are experiencing distress. Confidentiality and privacy are also important factors that influence disclosure and help uptake. Reducing distress may be explicitly achieved by offering appropriate coping strategies and actions for individuals to regain control and agency; however, a safe and supportive help-offering environment is a prerequisite for promoting help-seeking, and help-uptake behaviors.

ARTICLE HISTORY
Received 19 September 2023
Accepted 14 May 2024

KEYWORDS
Distress; construction industry; mental health

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Background

In June 2021, the World Health Organization (WHO) released the "Live life" guide – a document designed to enable countries to develop comprehensive evidence-based national suicide prevention strategies (World Health Organization, 2021). The "Live life" guide references the link between the experience of distress and risk of suicide, and many of the interventions and strategies described in the "Live life" guide target distress, and distressed individuals, directly. The guide recognizes that distress is a significant risk factor for suicide and provides practical guidance on how to implement suicide prevention strategies.

It has been demonstrated that high levels of distress have a profound negative impact on the mental health of individuals, their families and friends as well as the wider community as well as on the economy (Cerel et al., 2014; Doran & Kinchin, 2019; Hilton et al., 2010; Hulls et al., 2022; Maple & Sanford, 2020). Overall, distress can have an adverse effect on a multitude of aspects of a person's physical and mental wellbeing and health (Carlisle & Parker, 2014; Mopkins, 2022; Pidd et al., 2017; Sun et al., 2022). A recent conceptual analysis based on a literature search of workplace psychological distress in the field of occupational health nursing by Mopkins identified an increase in demands, a lack of control, low levels of support, and bullying as antecedents of distress (Mopkins, 2022). Further, it was reported that fatigue, conflict, and time pressure were characteristics of perceived psychological distress, which could lead to mental and physical disorders, and loss of productivity.

While the term "distress" appears to be a frequently used concept, its meaning and interpretation may vary in different contexts (Jackson & Haslam, 2022; Kaiser et al., 2015; Nichter, 2010). The Oxford English dictionary defines distress as "senses relating to the exertion of pressure or strain," the Cambridge dictionary lists distress as "a feeling of extreme worry, sadness, or pain," the Merriam-Webster dictionary describes distress as "pain or suffering affecting the body, a bodily part, or the mind," and Kessler and colleagues have described psychological distress as "feeling so sad that nothing can cheer you up" (Cambridge Dictionary [Internet], 2021; Merriam-Webster dictionary, 2021; Kessler et al., 2003; Oxford English Dictionary, 2021; World Health Organization, 2021). Yet, anthropological and transcultural psychiatry research has highlighted that there is important cultural variation in expressions and articulations of distress (Kaiser et al., 2015; Nichter, 2010). The WHO does not list a definition for distress, however, provides a definition of "stress": "a state of worry or mental tension caused by a difficult situation" (World Health Organization, 2021). In the context of research focussing on the construction industry, distress is often investigated in terms of Kessler's definition of "psychological distress" (e.g., Bowen et al., 2018;

Bowers et al., 2018; Carlisle & Parker, 2014; Dennerlein et al., 2021; Dong et al., 2022; Jacobsen et al., 2013; Sun et al., 2022), which is commonly associated with mental and behavioral disorders such as anxiety and/or depression.

Recognizing diverse meanings of distress, including cultural and gender-specific variations (Kirmayer, 1989; Lennon, 1987; Piccinelli & Simon, 1997), is crucial for informed decision-making, better identification in at-risk groups, and tailored solutions. Specifically, rigid definitions may not resonate with the experiences and/or understanding of a concept within a specific group or community. For example, the workplace can be a source of specific stressors that do not necessarily arise in other contemporaneous contexts for an individual (e.g., workplace bullying) and that are specific to the type of work (e.g., specific workplace or industry risks such as impact of external economic factors, or specific occupational health and safety risks). The specific nature of the workplace itself may therefore give rise to different types of concern being more prominent. This could have direct (and potentially negative) implications on the translation of, for example, research findings to promote successful intervention and prevention strategies. Targeted improvements (including non-clinical support) to support the health and wellbeing of any workforce, and occupational groups (such as the construction industry) who experience high levels of distress, may have additional benefits of increasing performance and productivity, as well as positive impacts on the welfare of the wider community.

Importantly, the "Live life" guide explicitly lists workplaces, trade unions, professional associations, and business leaders as key stakeholders that are vital for suicide prevention (World Health Organization, 2021). As part of this, it is widely acknowledged that non-clinical pathways are needed to support those in crisis and to adequately meet their needs; however, there is little evidence to guide how these pathways might operate in an optimal system (Duggan et al., 2020; Kerr et al., 2022). Providing rigorous conceptualisations for the experiential states that are best supported by non-clinical models of care provides one way of considering improved systems responses that maximize the benefits of multiple models of clinical and non-clinical care.

In Australia, one occupation in which workers disproportionately report distress is the construction industry, a male dominated profession (Australian Bureau of Statistics, 2020; Heller et al., 2007; Pidd et al., 2017). The aim of the present study was to capture the meaning and sources of distress, as perceived within the construction industry and we worked collaboratively with construction industry stakeholders to co-create a concept of "distress." A collaborative and dynamic approach, co-creation encompasses an evolving range of relationally and situationally appropriate research activities to find a solution to the question or problem posed (Fitzpatrick et al., 2023). We worked

closely with MATES in Construction (hereafter MATES) to co-create a definition of distress that was fit for purpose to the construction industry. MATES is a peer-led industry-based workplace program that uses a model of "support-offering," and developed in response to the rates of occupational suicide in the building and construction industry (Doran et al., 2021; Gullestrup et al., 2011; Martin et al., 2016). MATES raises awareness about mental health and suicide and offers a non-clinical approach to workplace suicide prevention focusing on creating a culture of help-offering, with the aim to connect workers in distress to suitable services.

An accurate, contextually appropriate, and ecologically valid definition of the term "distress" is considered useful, as it may provide a framework to establish meaningful models of care for construction industry employees and future research efforts.

Methods

Study design

This study was undertaken collaboratively with industry participants to co-create a definition of distress, specifically co-ideation, defined as "engaging in open dialogue to share new and creative ideas for the solving of problems relating to new products, services, policies and programs" (Pearce et al., 2020).

Ethics

This project was approved by the Human Research Ethics Committee of The University of Queensland (2021/HE001047).

Study setting

This research project was set in the Australian states of Queensland (QLD), New South Wales (NSW), South Australia (SA), and Western Australia (WA), in 2021 and 2022. The project consisted of two parts: (1) a face-to-face consultation held in QLD, and (2) qualitative phone interviews (which also included a voluntary follow-up online survey) conducted in NSW, SA, and WA (see Figure 1).

Study participants

MATES facilitated industry connections and participant recruitment for the study. In total, 56 individuals participated in the study. All participants provided their consent (verbal or implied), as per approvals.

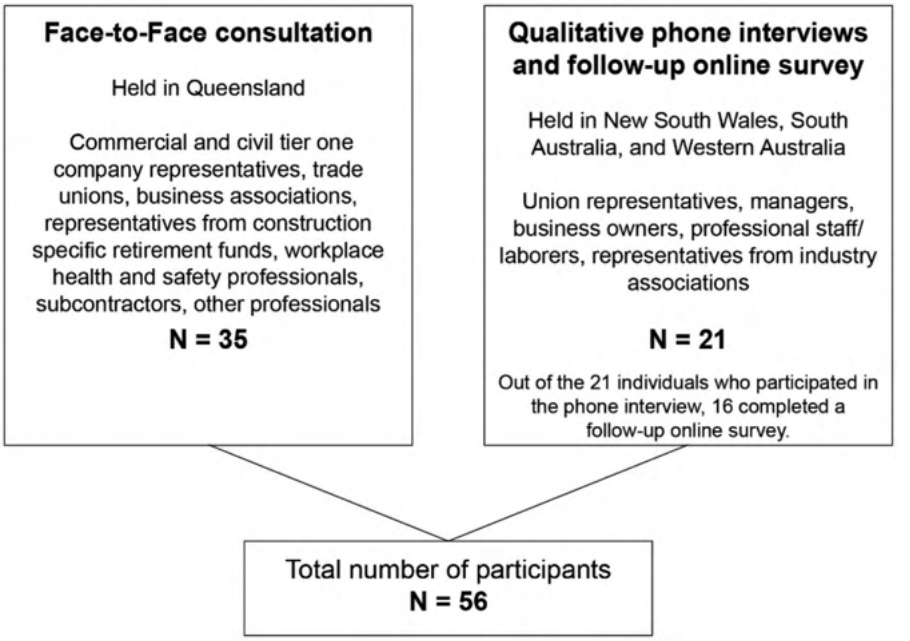

Figure 1. Description of study cohort.

Face-to-face workshop

To initially examine what distress means to construction industry workers, a structured face-to-face workshop was hosted by MATES in collaboration with The University of Queensland in June 2021.

The consultation followed a formal agenda and was mediated by a facilitator. It included a formal welcome to all attendees as well as a presentation around the project and the purpose of the research activity. Participants were then prompted to individually answer one question "What do you associate with distress?." This answer was given privately and anonymously, *via* an online Checkbox form accessed *via* QR code. Workshop participants were then invited to discuss in six groups what they associated with distress and how they would define it with reference to the following four questions: (1) "What is distress? Come up with a common definition of distress," (2) "In your workplace/association/organization, what is the indication that someone is distressed?," (3) "In your opinion, where do industry people turn up when they are distressed? List all options," (4) "How does help offered impact lives?." At the end of the workshop, participants were able to ask questions and/or provide feedback; all participants were formally debriefed.

Individually inputted answers to the first question posed were recorded as free text in non-identifiable form and were exported as standard .csv file for analysis (string of free text). Answers from the group discussion were

recorded by each group on butcher's paper and collated by researchers in an excel spreadsheet for further analysis.

Qualitative phone interviews and online survey

To test the generalizability of workshop findings, interviews were conducted with construction industry workers from NSW, SA, and WA *via* telephone or Microsoft Teams, in May 2022. Participants were invited to complete a Qualtrics survey to obtain demographic information as well as ranked responses on agreement with different definitions of distress.

Interviews consisted of seven questions that built on workshop questions: (1) "What does distress mean to you? Can you define it?," (2) "Off the top of your head, what concepts, or things, do you associate with distress, or being distressed?," (3) "In your place/association/organization, what are the indicators that someone is in distress?," (4) "In your opinion, where do industry people turn up when they are distressed?," (5) "In light of our discussion about distress, what might help look like to someone in distress?," (6) "How might someone signal that they need help for distress?," (7) "What factors might positively influence someone to seek help for their distress?" All interviews were audio recorded and transcribed.

The follow-up Qualtrics survey consisted of five questions. The first question prompted individuals to rate the extent to which they agreed with these five definitions: (1) "a sense relating to pressure or strain," (2) "a feeling of extreme worry, sadness, or pain," (3) "pain or suffering affecting the body, a bodily part, or the mind," (4) "feeling so sad that nothing can cheer you up," and (5) "an emotional state in which individuals feel that they are not in control, overwhelmed, or are unable to cope." (Cambridge Dictionary [Internet], 2021; Merriam-Webster dictionary, 2021; Kessler et al., 2003; Oxford English Dictionary, 2021; World Health Organization, 2021). Responses were collected *via* a 5-item Likert scale (strongly agree, agree, neither agree nor disagree, disagree, strongly disagree). The second question asked individuals to rank the definitions, from most to least applicable. Question three asked about the individual's gender (female, male, non-binary/third gender, prefer not to say), and question four asked individuals about their age (15–24, 25–34, 35–44, 45–54, or 55 years or above). The last question collected occupational information (apprentice, labourer/operator/tradesperson, leading hand/foreman, other manager (e.g., site manager, offsite manager, operations manager, project manager, quality manager, WHS/IR/HR manager), other professional staff (e.g., engineer, estimator, administrator), representative of industry organization/association, union representative, or "other."

Analysis

Analysis comprised both quantitative and qualitative approaches.

Cohort characteristics

Demographic data were not surveyed for the face-to-face workshop, however, sex characteristics could be reliably coded post-hoc based on attendees list. Additionally, qualitative details regarding the profile of attendees, as these were known to the authors, are provided.

Quantitative demographic data from the online survey conducted in the second phase of this study were analyzed descriptively (count, percentages, and ranks). Quantitative analyses were conducted using standard text processing programs and R (R Core Team, 2019).

Development and validation of the definition of distress

There were three parts to the development and validation of the distress definition: (1) inductive analysis of content and themes of data gathered in the face-to-face workshop in QLD; (2) confirmation with qualitative data gathered in subsequent interviews with stakeholders from other states; and (3) quantitative descriptive analysis of survey responses assessing ranked agreement with different definitions of distress.

Analysis of themes and topics associated with distress and help-seeking

Consistent with an iterative applied co-creation approach, qualitative analysis combined content and thematic approaches to best interpret relevant information gathered with respect to the questions of interest. Data on content, themes and topics associated with distress were analyzed inductively albeit within a framework guided by workshop/interview questions. Individual and group responses recorded during the workshop and interviews (conducted by LW, CM, and LC) formed the basis for the qualitative data analysis. Recurrent content, themes and ideas related to each question were identified, systematically labeled, and categorized by LW but informed through ongoing discussion and iterative review of the manuscript by all authors and LC (Neale, 2021; Pope et al., 2000). The qualitative analyses focussed on identifying differences and similarities across participants' responses, and the identification of key concepts and recurrent themes. Where appropriate, data were analyzed descriptively (count, percentages, and ranks). Analyses were conducted using standard text processing programs and R (R Core Team, 2019). Representative interview excerpts are provided to demonstrate themes. Participant numbers are provided to

distinguish between individuals. Numbers were assigned randomly to avoid inadvertent identification (e.g., based on order of participation) and demographics are not provided to protect privacy. Responses collated from the workshop are denoted "group workshop response" unless relating to individually inputted responses *via* the online form, which are assigned a random number with "workshop participant" added.

Results

Cohort characteristics

The face-to-face workshop was attended by 35 construction industry representatives (28 males). Participants in the facilitated workshop were Connectors and Assist volunteers who had already undertaken components of the MATES in Construction program. All participants had, therefore, individually volunteered to support a colleague who may be experiencing distress and had the initial framework for identifying and supporting a worker in distress to receive support. The nature of the MATES in Construction program meant that individual volunteers were present from the cross section of trades and roles within the industry consistent with an all of site approach rather than a management or worker heavy pool of volunteers. Participants spanned the scope of the industry including commercial and civil tier one and tier two company representatives, trade union representatives, employer associations and retirement funds. Workplace health and safety professionals and smaller subcontractor and trades-based professionals, such as carpenters and plumbers, were also part of the workshop confirming a diverse and representative pool of industry professionals.

For the qualitative phone interviews, MATES Queensland identified a total of 53 individuals as potential participants. Of these, 21 individuals (18 males) participated, and 16 individuals completed the additional online survey. Most survey participants were male (81.25%), occupied a managerial role (56.25%), and were between 45 and 54 years of age (68.75%).

A novel definition of distress

Qualitative inductive analysis of content and themes in the responses from the 35 workshop attendees showed that answers diverged from common dictionary definitions of distress. Identified labels included elevated levels of anxiety/alarm/stress, discomfort, being out of control, changes in behavior, inability to cope/perform/rationalise, physical versus emotional responses, and possible causes. Themes identified were action-orientated, for example, in conveying a sense of loss of control, being overwhelmed, or expressing the inability to cope. Attendees recognized that distress may be a transient

emotional state. There was a notable absence of emotionally loaded words like "sadness" or "worry" (core components of standard definitions).

Interview participants described distress as a change in behavior, discomfort, emotional and physical reactions, and feeling that things are happening beyond someone's control, the inability to think clearly and a sense of being unable to cope in a healthy way. Respondents suggested that distress may result from different sources, such as work-related demands, personal life events, and traumatic incidents. Some participants suggested that it can be difficult to define distress, as it may not always be obvious or physical. Overall, responses suggested that distress can have a negative impact on individuals' physical and mental health.

Based on this, we proposed that distress for construction industry workers could be most adequately described as "an emotional state in which individuals feel that they are not in control, overwhelmed, or are unable to cope."

Representative excerpts are presented below:

> "Distress results when we're out of control … or you know … we've got things that are [sic] that are really pushing us from a timeline perspective that we're struggling to achieve and we're not feeling like we're in control to be able to deliver those things." (P24, interview participant).

> "An emotional state in terms of turmoil and stress or basically your emotions kind of take hold and you are unable to rationalise and what is happening around you is distorted." (P14, interview participant).

Definition rankings

Rankings of distress definitions indicated that the definition of "an emotional state in which individuals feel that they are not in control, overwhelmed, or are unable to cope" most adequately described distress for individuals working within the construction industry among choices given. The second most applicable definition was "a feeling of extreme worry, sadness, or pain," followed by "pain or suffering affecting the body, a bodily part, or the mind," and "feeling so sad that nothing can cheer you up." The definition of "senses relating to the exertion of pressure or strain" was overall ranked as the least applicable definition of distress (Table 1).

Topics and themes associated with distress in the construction industry

In addition, the face-to-face consultation workshop and individual phone interviews highlighted attributes associated with distress, including their relationship to identifying or accessing help.

Table 1. Ranking of definitions based on the participants' responses in the qualtrics survey of their applicability to distress in the construction industry. Other = neither agree nor disagree, disagree, strongly disagree. N = 16.

Rank	Definition	Strongly agree	Agree	Other
1	An emotional state in which individuals feel that they are not in control, overwhelmed, or are unable to cope.	87.50%	12.5%	0%
2	A feeling of extreme worry, sadness, or pain.	81.25%	12.5%	6.25%
3	Pain or suffering affecting the body, a bodily part, or the mind.	50.00%	43.75%	6.25%
4	Feeling so sad that nothing can cheer you up.	50.00%	31.25%	18.75%
5	Senses relating to the exertion of pressure or strain.	12.50%	62.50%	25.00%

Reasons for distress and/or impacts of distress

Distress or being distressed was associated with a range of challenges. Specifically, these included: financial issues, relationship problems with family or friends, and work-related issues such as job security, job satisfaction, long working hours, exposure to the elements, complex changing work environment, and a "dog-eat-dog type culture" (*P16, interview participant*). In addition, feeling unsafe, being emotional (In this context, participants explicitly stated "being emotional," alongside "expressing worthlessness," "compounding misery," being "short tempered," "irrational - disproportionate response[s]," "heightened frustration," "irritability," being "angry," "an elevation of a feeling," being "very influenced by your emotions," "a level of agitation," *workshop responses*), and substance abuse were also mentioned and could be both a reason for and/or a result of distress.

Indicators of distress

A cross-cutting theme identified in both workshops and individual interviews related to identifying distinct and noticeable change in behavior, mannerisms, or attitude, such as: becoming evasive or frustrated; demonstrating a lack of care for their own or others safety; showing symptoms of alcohol or drug abuse, such as arriving to work with a flushed face or smelling of alcohol; emergent absenteeism; behaving differently by being distant, withdrawn or not as talkative as usual (if usually gregarious and engaged); or being "out of character," in terms of demeanor, body language, and/or physical appearance; being impacted by other health issues; noted drop in work performance or making more mistakes than usual. Further, participants identified that, when in distress, conversations may become more tense, and individuals may be aggressive or have mood swings; distressed individuals might raise their voice or show other signs of agitation. In addition, participants identified relationship breakdowns as a key contributor to distress. One participant described how one could "hear and feel" distress in the workplace:

> "It's looking for the cues of what's different; it's really around looking for those signals at an individual level." (P24, interview participant).

> "Lack of care for their own safety or the safety of people around them." (P16, interview participant).

> "We've got an open plan office you can … you can hear it and you can feel it when there's stress and distress in the workplace. You know the volume goes up the conversations become more tense and there's less … less laughter and more louder words and so on." (P24, interview participant).

Support for individuals in distress

Both specific organizations and individuals were mentioned as a source for help. Some workshop participants noted that people might turn to "those closest to them," others identified that they might instead turn to "someone who cares," whether or not that person was known to them.

In particular, MATES was mentioned as a specific organization that individuals might turn to when they are distressed. Also, supervisors, health professionals, employee assistance programs (EAPs), helplines, work colleagues, sport clubs and family members were mentioned to support individuals in distress.

> "Some people do go to health professionals; people turn to their families as well or someone close to them." (P25, interview participant).

Trust and approachability were key themes identified in the context of contemplating seeking support. For example, group workshop participants qualified their responses in the following ways: "colleagues *who you trust,*" "going to a supervisor *who you trust*" and/or turning to "approachable management" (*workshop group response*).

Workshop participants also noted that individuals might not always seek help from others. In a positive sense, participants highlighted the value of solitary forms of individual self-care, including activities such as "going bush, fishing or hiking" (*workshop group response*). Conversely, it was highlighted that individuals may turn to "no-one" and instead turn to substance abuse, gambling or excessive exercise, as a means to cope (*workshop group response*).

Barriers to help seeking behaviors

Some barriers to seeking help were identified, including a lack of gender and cultural diversity in the workplace, a male-dominated work culture, lack of trust in leadership or workplace that extends to distrust of employer provided supports (such as EAP), lack of perceived confidentiality and privacy, and that some individuals may try to hide their distress and/or work through their distress in secret. It was also noted that individuals who experience distress may not be able to ask for help or notice that help

is available and that there is no one-size-fits-all solution to promote help-seeking behaviors.

> "To a limited extent workers will turn to their EAP, but there is a lot of distrust about using an employer-sponsored service. […] Typically, blue collar men will work through their distress in secret - healthily or unhealthily - and they will suffer in silence." (P34, interview participant).

> "Male-macho work front, blokes don't share." (P12, interview participant).

Active help offering

Taking initiative and active help offering was mentioned as being crucial. A quick chat, asking "are you okay?," affirmations of the value and esteem in which a person is held, distraction, or taking them to a quiet place to have a chat were also mentioned. As some individuals might hide their distress, it was suggested that it may require someone else to pick up on the signs of distress and reach-out. Additionally, it was suggested that services like MATES may encourage trust to connect with help.

> "The most important thing is to have a culture and people with skills that can identify have the courage or have the ability to … have … to open that conversation and to and know where to [sic] where to take that conversation." (P24, interview participant).

> "To realise that there is somebody out there that loves them and that that that [sic] they … you know … that they are worthwhile." (P28, interview participant).

> "Most people can't put their hand up and it requires a team member or a manager to pick up on the signs and sit down with them and have a chat […]." (P18, interview participant).

Workshop participants suggested that proactive help offering could save lives by breaking down (emotional) barriers, creating a sense of relief, reinforcing relationships (including shared awareness, connection, belonging, and validation), and providing perspective. Overall, help offered could have a significant positive impact on people's lives by providing support, mateship, and a sense of belonging, leading to improved mental health and wellbeing. It was also noted that offering help not only helps the individual but can also have positive effects on their family, friends, and those close to a person. It was suggested that help offering "knocks you into action" (*Group workshop response*).

Creating a safe work environment

Respondents identified that employers should change the cultural and structural conditions at work to promote mental health and wellbeing and that people should not be seen as weak for seeking help. Participants

highlighted that the workplace should be a safe space where people can seek help without fear of stigma or negative consequences. The importance of privacy and confidentiality in seeking help for distress was emphasized, so that individuals could feel safe and secure in seeking help. In this regard, "storytelling" (based on "lived experience") (*P31, interview participant*) and informal meetings and morning teas were seen as a potentially powerful facilitator. It was noted that it was important that individuals know where they can go for help (e.g., workplaces advertising organizations like MATES or Lifeline) and making services easily accessible. Further, it was highlighted that people need to be adequately trained in identifying distress and providing support.

> "Construction industry is not a safe environment to open up." (P12, interview participant).
>
> "The person has to be confident that their problems do not get broadcasted, particularly not to their employer." (P14, interview participant).
>
> "Getting people together for a morning or afternoon tea; sending people around to have those conversations and walk around the office with a cup of tea and have a chat to somebody." (P24, interview participant).

In summary, the importance of creating a supportive and discrete work environment that fostered trust, where team members can pick up on the signs of distress by "knowing your mate," and picking up changes in demeanor, and where support was actively offered was emphasized, as many individuals may not be able (or willing) to explicitly signal that they are distressed. Breaking down this barrier by proactively offering help might positively influence people's attitude toward help-seeking and was perceived as beneficial to the wider community.

Discussion

We collaborated with construction industry stakeholders to develop a shared understanding of the term "distress." Based on our findings, we propose that distress may be best described as "an emotional state in which individuals feel that they are not in control, overwhelmed, or are unable to cope."

While previous studies have investigated distress within the construction industry, predominantly within the context of psychological distress (Bowen et al., 2018; Bowers et al., 2018; Carlisle & Parker, 2014; Dennerlein et al., 2021; Dong et al., 2022; Jacobsen et al., 2013; Sun et al., 2022), based on our findings, it may be beneficial to use a more targeted definition that differs from a definition that employs a clinical lens, to emphasize a holistic and nuanced approach that considers a broader range of factors and experiences and resonates with individuals working within the construction industry. This in turn may have a direct impact on the

development and success of novel intervention and prevention strategies. However, further research is needed to examine this hypothesis. Inductive analysis of content and themes highlighted that distress is a complex issue that can have both personal and work-related causes. Workplace culture and awareness of available resources are critical factors in supporting individuals who are experiencing distress, and confidentiality and privacy are important factors that influence help seeking behaviors. There is a recognition that workforce culture needs to change, and employers need to actively engage in the mental health space by creating safe and discrete spaces and promoting an open-door policy for employees. Respondents suggested that proactive offering of help in a trusting environment may be important as individuals might not seek help themselves or maybe unable to "see" help during times of distress. MATES was mentioned as a specific organization that can help to create a trusting environment.

A recent qualitative study by Hulls et al. investigated the experiences and perceptions of work-related stress in the construction industry (Hulls et al., 2022). Consistent with our findings, Hulls et al. found that major stressors included workload, job insecurity, time pressures, and conflicts with colleagues. Hulls and colleagues highlighted the need for a cultural shift toward prioritizing employee wellbeing, creating supportive environments, providing adequate support, and promoting mental health awareness (Hulls et al., 2022).

A mixed-methods study by Ross and colleagues examined the factors related to workplace bullying and its impact on the mental health of construction industry apprentices (Ross et al., 2021). Findings indicate that workplace bullying is prevalent among apprentices, with a significant impact on their mental health. Factors associated with bullying include poor communication, a lack of support from supervisors, and unsafe working environments. While some of these aspects were also named by our study participants, our study population was markedly older and occupied a managerial role. However, one common theme that was identified was the need for interventions to prevent and address distress experienced within the workplace and the importance of creating a safe and supportive working environment. Importantly, a safe and supportive environment was not only identified as a prerequisite for successful help-offering, but also help-seeking behaviors.

Sun and colleagues showed that exposure to psychosocial hazards (e.g., job demands/control/insecurity, supervisor and coworker support, and work-family conflict) were significantly associated with poorer mental health outcomes for individuals working within the construction industry (Sun et al., 2022). Findings highlight the need for interventions that focus on reducing psychosocial hazards and promoting coping strategies to improve the mental health of construction workers.

Reducing distress may be explicitly achieved by offering coping strategies and facilitating actions that help individuals to regain control. Studies which include a strong leadership and involvement of individuals directly affected by the topic at hand may provide unique insights to develop effective solutions and/or workplace education programs. This can only be achieved by further investigating and identifying relevant concepts in different contexts. Importantly, further research is required to clarify whether the obtained definition is specific to the construction industry or is a valid general definition of distress.

Limitations

Individuals who participated in this research predominately occupied managerial roles. However, managerial involvement was just over 50% (9/16) and, based on content disclosed in interviews, it appears that most individuals in these positions within the construction industry do understand the perspective of blue-collar workers as they have been in such a role at some stage within their career themselves. Further, volunteer Connectors who had undergone the MATES in Construction program participated in semi structured interviews to confirm definitions of distress. These Connectors as per the MATES in Construction program represented diverse roles within the industry from sites-based supervisor's and leading hands to workplace health and safety professionals to general laborers. Connectors as volunteers were recruited primarily based on their role on site or trades-based background, rather than specific interest and desire to support colleagues experiencing distress, overwhelm or suicide ideation. Nevertheless, any future research efforts within this field should employ a research design that specifically includes a balanced and structured sample of participants spanning an even range of roles across the construction industry.

Conclusion

Based on our findings, we suggest that distress for construction industry workers can be described as "an emotional state in which individuals feel that they are not in control, overwhelmed, or are unable to cope." Within the construction industry help seeking for distress can have numerous complexities attached to perceived or real consequences. Creating a trusting workplace culture, promoting confidentiality, and fostering an environment for help seeking are crucial for supporting distressed individuals in the construction industry. Shifting toward a culture of "help offering," where the community and industry take responsibility for facilitating support and acceptance, is essential in addressing the complexities of seeking help. Future research will benefit from a wider sampling of individuals with lived experience and different roles to

explore the full range voices of construction industry workers, and the possibility of role-related differences. Research examining the utility of this construct of distress in the enhancement of service delivery, and as a measurement tool to evaluate initiatives is warranted.

Acknowledgements

We would like to thank Laura Cox, Michael Lam, MATES in Construction QLD, the Queensland Mental Health Commission, and all participating industry organisations and representatives.

Disclosure statement

NT is a current MATES in Construction employee. JG and RB are former MATES in Construction employees. While this project does not result in a financial benefit to NT, RB, JG or MATES in Construction, it is in the interest of MATES in Construction to demonstrate the organization's research capacities and foster relationships with the invited construction industry organizations. LW, CMD, EH, and CSM declare no competing interests.

Ethical approval

This project was approved by the Human Research Ethics Committee of The University of Queensland (2021/HE001047).

Funding

This study was funded by MATES in Construction and the Queensland Mental Health Commission.

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Data availability statement

The data that support the findings of this study are available on request from the corresponding author, LW. The data are not publicly available to warrant the research participants privacy.

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Strong minds, safe sites: enhancing mental and physical wellbeing in construction

A MATES in Construction (QLD & NT) Ltd and Queensland Mental Health Commission funded project.

This report was commissioned by MATES in Construction (QLD & NT) Ltd and the Queensland Mental Health Commission. For further information, please contact Associate Professor Carla Meurk, Principal Researcher, Queensland Centre for Mental Health Research, The University of Queensland on Carla.Meurk@health.qld.gov.au

Suggested citation: Meurk, C., Wittenhagen, L., Lam, M., Doran, C., & Heffernan, E. (2024). Strong minds, safe sites: enhancing mental and physical wellbeing in construction. Brisbane: Queensland Centre for Mental Health Research.

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Strong minds, safe sites: enhancing physical and mental wellbeing in construction.

August 2024

A MATES in Construction (QLD & NT) Ltd and Queensland Mental Health Commission funded project.

Assoc Prof Carla Meurk, Dr Lisa Wittenhagen, Dr Michael Lam,
Prof Chris Doran and Prof Ed Heffernan.

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Queensland Mental Health Commission

Acknowledgements

In the spirit of reconciliation, the Queensland Centre for Mental Health Research (QCMHR) respectfully acknowledges the Traditional Owners as the custodians of the lands in which QCMHR operates. We pay our respects to their Elders, past and present, and extend that respect to Aboriginal and Torres Strait Islander peoples today.

We acknowledge people in our communities with lived experience of mental health, drug and alcohol concerns, and those who care for them. We respect and value their generous contributions to our research.

We acknowledge the role of construction industry workers to Queensland's economy and community and those with lived and living experience of mental health, alcohol and other drug problems, and suicide, their families and carers.

The authors would like to acknowledge Data Linkage Queensland for undertaking linkage activities, and BUSSQ, BERT, MATES in Construction (QLD & NT) Ltd, WorkCover Queensland and the Queensland Ambulance Service for facilitating data extraction for this project. We thank Jorgen Gullestrup, Dr Laura Cox, Dr Damian Santomauro, Dr Ruth Barker and Professor Marco Reale for their contribution of expertise for conceptualisation and/or analysis. The authors also give thanks to Lucretia Ackfield, Laura Corcoran and Liz Christiansen for editorial assistance, project management and visual design.

The study was funded by the Queensland Mental Health Commission and MATES in Construction (QLD & NT) Ltd. Assoc Prof Carla Meurk, Dr Michael Lam and Prof Ed Heffernan receive salary support from Queensland Health. The views expressed in this publication are not necessarily those of the above-named organisations or individuals, and any errors of omission or commission are the responsibility of the authors.

Content warning

The findings contained in the report relate to topics of distress and suicidality. Deaths and characteristics relating to deaths that occurred over this period are reported. We pay our respects to those who died and their families, friends and loved ones. Behind every data point is a person whose experiences cannot be fully encapsulated in findings reported. Efforts have been taken to ensure that individuals whose data is contained in the report do not have their identities inadvertently revealed. Our intent in presenting these findings is to enhance systemic responses in a way that benefits the health and wellbeing of construction industry workers now and in the future.

Executive Summary

The *Strong minds, safe sites: enhancing mental and physical wellbeing in construction* report focuses on distress among Queensland construction industry workers, its drivers, impacts and opportunities for connection with support services. It highlights key findings from a study conducted by researchers from the Queensland Centre for Mental Health Research, in collaboration with construction industry organisations, which aims to improve systemic caring responses for people in the construction industry who experience distress.

Research approach

This study aimed to:

1. Determine the prevalence of distress experienced by construction industry workers
2. Detail their health service use prior to and following a distress-related interaction with a construction industry organisation
3. Examine demographics, health characteristics and outcomes (including deaths) of people who had a distress-related interaction with a construction industry organisation
4. Identify opportunities for connection and help-offering for people experiencing distress.

All workers who had a distress-related interaction with one of four major organisations in the construction industry (MATES in Construction (QLD & NT) Ltd, BUSSQ, BERT or WorkCover Queensland) in Queensland from 1 January 2018 to 31 December 2020 (inclusive) were identified and this data was linked to Queensland Health administrative datasets from 1 January 2017 to 31 December 2021 (inclusive).

What is distress?

The definition of distress used in this study was co-designed during an earlier phase of research in close consultation with the construction industry and other stakeholders, including people with lived experiences of distress and suicidality.

> Distress is "an emotional state in which individuals feel that they are not in control, overwhelmed, or are unable to cope" (Meurk & Wittenhagen, 2021; Wittenhagen et al., 2024).

For the purposes of this report, all distress-related interactions occurred with one of the four construction organisations, unless otherwise specified, and related to:

> issues of coping, alcohol or drug related distress, psychological distress, including mental health problems and suicidality, a need for compassionate support, relationship issues, financial hardship, and other reasons meeting the definition of distress as defined above.

An interaction was counted each time someone disclosed they were experiencing distress-related issues. Note, they may not have requested assistance to resolve these issues.

The findings

Frequency and demographics

A total of 10,548 people had a distress-related interaction between 1 January 2018 and 31 December 2020 (inclusive). This equates to more than nine people per day or 4.4% of workers in Queensland's construction industry.

People experiencing distress were predominately male (94.4%) with a median age of 40 years, and 6.5% of the total group had an Aboriginal and/or Torres Strait Islander background.

Health services interactions

Most people who had a distress-related interaction also sought support from an emergency department (71.8%) and/or were admitted to hospital (61.8%). A total of 39.4% were attended by the Queensland Ambulance Service (QAS) while 14% were assisted by a public mental health service.

Around half (49.7%) of the group who advised a construction organisation that they were experiencing distress also received assistance from a health service for an injury. Of these, around two-thirds (64%) had their first injury presentation before their first distress-related interaction.

There was a steep increase in injury-related presentations in the 14 days before a distress-related interaction with a construction industry organisation.

There was a notable peak in injury-related presentations to emergency departments and hospitals early in the week (Monday and Tuesday), and during the mid-morning and midday periods (approximately 11am to 1pm).

A total of 6% of people who had an injury-related hospital admission[1] had a presentation that was coded as intentional self-harm, and higher rates of mental health diagnoses were evident for those admissions.

The overall contact rates with health services increased from an average of 123 presentations per day before a distress-related interaction to 137 per presentations per day afterwards. This amounts to an approximate 10% increase.

Mental health profiles

Substance use, trauma and stressor, and depressive disorders were the most common diagnoses for people who had contact with a public mental health service and received a mental health diagnosis.

A total of 14% had interactions with mental health services and most of these involved acute care services, including police, ambulance and mental health co-responder services.

Loss of life

One percent (106) of the overall group died between 1 January 2018 and 31 December 2021. The top five causes of death were (in order, highest to lowest) heart disease, cancer, suspected suicide, respiratory disease and alcohol-related liver disease. Suspected suicide deaths accounted for 24.5% of deaths during this period.

On average, approximately 12 to 18 months elapsed between the first distress-related interaction, and hospitalisation due to intentional self-harm or death due to suspected suicide.

The average length of time between the last distress-related interaction with a construction organisation or last health service contact, and a suspected suicide death, ranged between six months and 10 days respectively.

Implications

Differences between distress and a mental health diagnosis

Research findings suggest people experiencing distress will not necessarily meet the diagnostic criteria for a mental health disorder or be experiencing a mental health crisis. Additionally, construction workers will frequently disclose distress to organisations outside the mainstream health system, but a minority of these people will have contact with a mental health service.

[1] Based on admissions to a Queensland Hospital only. This does not include injury or poisoning-related presentations to emergency departments.

Implications for service delivery

People in distress did not generally access public mental health services or mental health support through emergency departments or ambulance services unless they were experiencing a mental health crisis. It is possible that people accessed federally funded mental health services such as general practitioners, psychiatrists or psychologists, but confirming this information would require additional investigation with data linkages to the Medicare Benefits Schedule and Pharmaceutical Benefits Scheme. However, the findings highlight the importance of non-clinical services that can provide caring and practical support for people experiencing distress.

The relationship between injuries and distress

A high proportion (nearly 50%) of people who experienced distress were also treated for an injury in an emergency department or hospital, and injuries occurred both before and after a distress-related interaction. These findings highlight the interconnection of physical and mental health, and the need for holistic responses to improve both physical and mental health and wellbeing.

Opportunities for connection and help-offering

Information about how and when people interact with health services and construction industry organisations can be used to ensure services are delivered at the right place and time. The study identified multiple touch points where support could be offered to mitigate distress and potentially reduce the likelihood of a future injury.

The way forward

Several opportunities to improve responses to distress, and enhance help-offering were identified during this study.

1. **A partnership approach** between health services and MATES in Construction (QLD & NT) Ltd could help ensure distress is identified earlier and more effectively mitigated, or prevented. This approach should involve close collaboration with emergency departments as they are accessed by most people. Due to the link between injuries and distress, this could also have secondary benefits and reduce injuries overall.
2. **Enhancing connectivity** across the construction industry could drive more innovative and integrated ways to recognise and respond to distress. Comprehensive initiatives that assist employees to identify distress, and facilitate sensitive and appropriate engagement, disclosure and support would further strengthen these approaches.

3. **Providing help at the right time and place** could improve outcomes for people experiencing distress. This could include targeted early interventions when workers attend emergency departments for injuries or initially identify distress with a construction industry organisation. Extending follow-up processes by 12 to 24 months could also help ensure people experiencing worsening distress receive additional and tailored support.
4. **Investigating the links between distress and injury prevention initiatives** could lead to improved workplace health and safety in the construction industry.

Figure 1. Summary of findings

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Acronyms and abbreviations

Acronym / abbreviation	Description
BERT	Building Employees Redundancy Trust
BUSSQ	Building Unions Superannuation Scheme Queensland
CIMHA	Consumer Integrated Mental Health and Addiction Application
COD URF	Cause of death unit record file
ED	Emergency department
EDC	Emergency Data Collection
QAS	Queensland Ambulance Service
QHAPDC	Queensland Hospital Admitted Patient Data Collection
QHNAPDC	Queensland Hospital Non-admitted Patient Data Collection
RBDMs	Registries of Births, Deaths and Marriages

Glossary

For the purposes of this report, the following definitions apply.

Term	Description
Cohort	Construction workers who were identified as having one or more distress-related interaction with any of the construction industry organisations (identified below) from 1 January 2018 to 31 December 2020.
Construction industry organisations	MATES in Construction (QLD & NT) Ltd, Building Employees Redundancy Trust (BERT), Building Unions Superannuation Scheme Queensland (BUSSQ), WorkCover Queensland.
Distress	An emotional state in which individuals feel that they are not in control, overwhelmed, or are unable to cope.
Distress-related interactions	Relate to issues of coping, alcohol or drug related distress, psychological distress (including mental health problems and suicidality), a need for compassionate support, relationship issues, financial hardship, and other reasons meeting the definition of distress (see above).
Episode rate	Describes the frequency of distress-related interactions among the cohort.
Health services	Refers to health services predominantly funded and delivered by the Queensland Government.
Interactions	Contact with a construction industry organisation or health service.

Background

Approximately 9% of the Australian workforce is employed within the construction industry, making it the third largest workforce in the country (National Skills Commission; The Department of Education Skills and Employment). Work within the industry is often characterised by variability in the security and frequency of work opportunities, long working hours and the requirement to work in remote locations with varying working conditions, contracts and support across different trades and contractors. The majority of this workforce are male. An estimated 15% are female and a low proportion of this group are involved in trades (CSQ, 2021).

Studies have identified workers in the construction industry are at a heightened risk of suicide (Maheen et al., 2020). However, the gap in suicides between males working in construction and those employed elsewhere appears to have narrowed over the past 20 years and this indicates prevention strategies within the sector may have improved outcomes (Maheen et al., 2020).

Several issues impact people who die by suicide and are employed in the construction industry. These include an inability to obtain steady employment, injury or major illness, and relationship issues (Heller et al., 2007; Milner et al., 2014). However, research has not yet examined the characteristics of people who work in the construction industry and experience distress.

The most appropriate and caring ways to respond to someone in distress are still being identified and developed. There is relatively new interest in addressing distress within the context of suicide prevention, and an increasing focus on providing non-clinical peer-led services. MATES in Construction (QLD & NT) Ltd is at the forefront of these approaches (World Health Organization, 2021).

Systematically enhancing holistic, caring and practical responses to distress requires identification of:

- the most appropriate definition of distress
- key touch points where people identify they are in distress
- the optimal care pathways for people in distress.

Constructing a definition of distress

The project team developed, tested and validated the following definition of distress through extensive consultation with MATES in Construction (QLD & NT) Ltd and other construction industry stakeholders, including those with lived experiences of distress and suicidality.

"Distress is an emotional state in which individuals feel that they are not in control, overwhelmed, or are unable to cope." (Meurk & Wittenhagen, 2021; Wittenhagen et al., 2024).

The types of distress referenced in this report include alcohol or drug related distress, psychological distress, mental health problems and suicidality, relationship issues and financial hardship.

Note, an agreed concept of distress that is contextually and culturally specific for the construction industry has not been previously defined within the suicide prevention sector or elsewhere.

Help-offering outside the health system

Making the most appropriate caring response available to people who need it, when they need it, is a core challenge for people who design, implement and manage elements of complex systems. This is further impacted in the context of responses to distress and suicidality, when a complicated and contested array of medical, practical and psychosocial factors may be at play.

The MATES in Construction (QLD & NT) Ltd model addresses part of this challenge by 'flipping the narrative' from discussing help-seeking, including its barriers and enablers, to emphasising the importance of help-offering (Ross et al., 2019). This reframing highlights the responsibility of every community and workplace to proactively ensure people receive help, feel cared for, and have the practical supports they need, and shifts the burden away from people who may feel overwhelmed, not in control or unable to cope. A help-offering approach asks us to consider the diverse places where people might identify distress and their need for support, including organisations that sit outside the health system.

Pathways

Another way to inform and enhance help-offering is by exploring the systems people traverse when in need of assistance. Administrative datasets provide traces of people's journeys and can be used to inform and evaluate both prevention and response initiatives. Combining a detailed understanding of the distress-related interactions outside the mainstream health system with health-related administrative datasets, can inform targeted and systematic approaches for help-offering.

Aims

This research project included the following aims:

1. To determine the prevalence of distress experienced by construction industry workers
2. To detail their health service use prior to and following a distress-related interaction with a construction industry organisation
3. To examine the demographics, health characteristics and outcomes (including deaths) of people who had a distress-related interaction with a construction industry organisation
4. To identify opportunities for connection and help-offering for people in distress.

Understanding the extent of distress-related interactions among people associated with the construction industry and their use of health services will provide valuable information regarding the need for services. It may also facilitate an evaluation of health service use and demand over time, and contribute to an assessment of the costs and benefits of different service models to reduce distress.

Methods

Ethics and governance

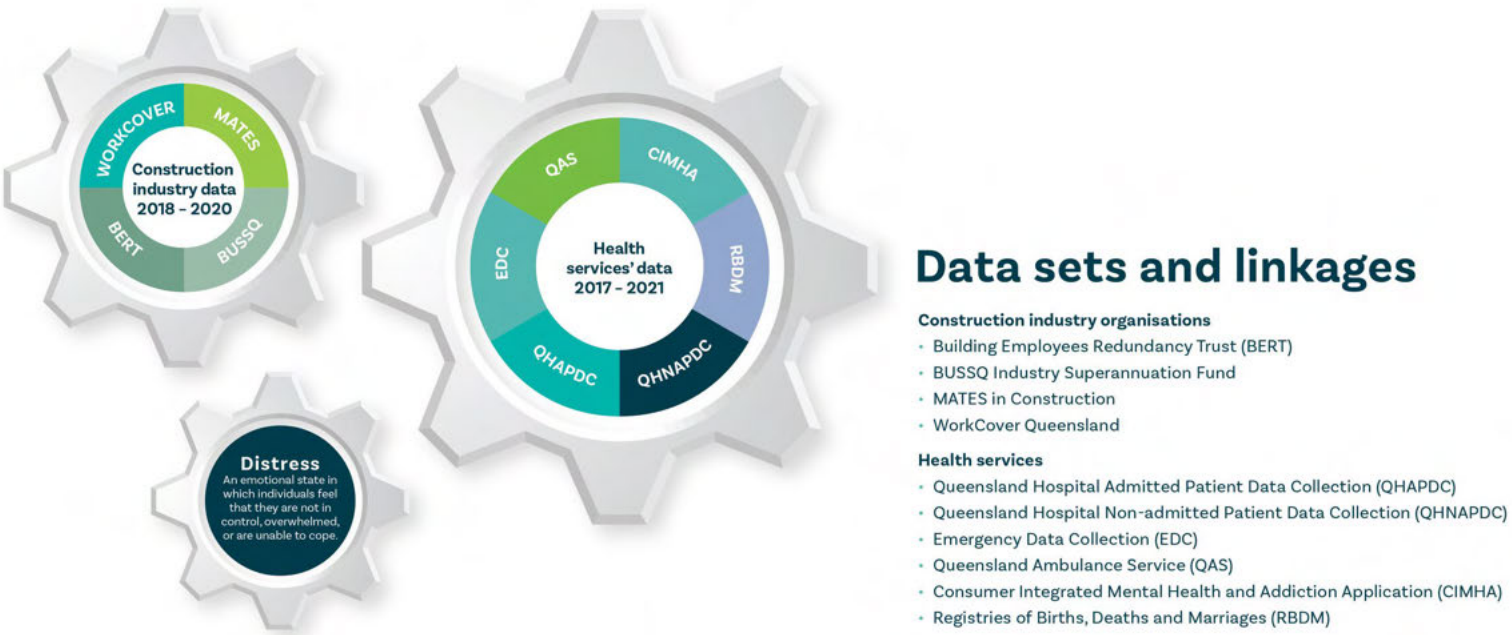
This project is a data-linkage study and was approved by the Human Research Ethics Committee of The University of Queensland (2021/HE001885). A waiver of consent was obtained under Sections 95 and 95a of the *Privacy Act 1988*. Legislative approval to access Queensland Health administrative data was granted via a Public Health Act Approval (21.1885).

Data linkage is the process of combining data from different datasets into a unified repository for analysis. This harnesses the power of routinely collected data to inform questions regarding complex processes. Data linkage is conducted using mathematical and statistical processes and is undertaken in ways that preserve the privacy and anonymity of people whose data is used, namely by adhering to the principle of separation, where content information is managed separately from identifying information to ensure records can be individually linked in a de-identified way.

Setting

This data-linkage study was set in the state of Queensland which had an estimated resident population of about 5.2 million people (as of 31 December 2020). Data from the Queensland Government Statistician's Office indicates the construction industry employed approximately 239,400 individuals in 2020 (https://www.qgso.qld.gov.au/).

Figure 2. Data sets and linkages



Data linkage

Step 1

Anyone who had a distress-related interaction with a construction industry organisation (see list below) from 1 January 2018 to 31 December 2020 (inclusive) was identified using criteria provided by the research team to the organisation.

Step 2

The construction industry organisations sent identifying information about this cohort to a third party to process securely. All individuals were then assigned randomly selected numbers to ensure their information was de-identified.

Step 3

The numbers were provided to the construction industry organisations who gathered relevant data associated with these numbers (employees or members) and supplied this to the research team for analysis.

The numbers were also linked to data from the Queensland Hospital Admitted Patient Data Collection (QHAPDC), Queensland Hospital Non-admitted Patient Data Collection (QHNAPDC), Emergency Data Collection (EDC), Queensland Ambulance Service (QAS) and the Consumer Integrated Mental Health and Addiction Application (CIMHA), as well as the Registries of Births, Deaths and Marriages (RBDMs) Cause of Death unit record file (COD URF). The data was linked over a five-year period (1 January 2017

to 31 December 2021) to enable researchers to understand how people interacted with health services before and following their first distress-related interaction with a construction industry organisation, and their outcomes following the interaction.

Step 4

Researchers collated and integrated all data, and conducted an analysis to identify connections, similarities and differences across the cohort, their interactions with construction industry organisations and health services, and outcomes.

Cohort identification

The cohort was identified through keyword and category searches of industry datasets provided by four construction industry organisations. The organisations are briefly described, as follows:

- MATES in Construction (QLD & NT) Ltd is an industry-backed, research-based, suicide prevention and support program. All people receiving case management were included in the research cohort.
- BERT is the Building Employees Redundancy Trust and provides redundancy payments and benefits to its members. All people who participate in this scheme were eligible for inclusion, subject to meeting the criteria outlined below.
- BUSSQ is a construction industry superannuation fund. All members who were associated with the construction industry were eligible for inclusion, subject to meeting the criteria outlined below.
- WorkCover Queensland is a government-owned insurance provider and provides services across several sectors. All people who contacted WorkCover Queensland and were associated with the construction industry were eligible for inclusion, subject to meeting the criteria outlined below. For simplicity, it is referred to as a "construction industry organisation" in this report.

Records were extracted for people working in the construction industry who had a distress-related interaction with any of the four construction industry organisations between 1 January 2018 and 31 December 2020.

Identifying distress-related interactions: criteria

Data fields, including free-text boxes, were searched for a range of distress-related terms using a method previously developed to identify individuals from free-text data (Meurk et al., 2022). This involved working on iterative data extracts to refine keywords and terms that identified distress and focused on maximising true positive cases. Initial search terms were based on the definition of distress.

For example, “out of his/her/their control”, “overwhelm*”, “distress*”, “unable to cope” and “not coping” (*indicates an allowance for word variations). Specific data fields, terms and keywords were also chosen to identify types of distress, including financial hardship, relationship issues and suicidality. Finally, terms indicating someone had been referred to specific services that assist people in crisis were identified. This search was tailored to the database structure of each participating organisation by closely working with their data teams. The details for people who were identified via this method (i.e. names, ages or dates of birth, addresses, sex) were securely transferred by the organisations to Data Linkage Queensland for linkage to Queensland state-wide datasets (Department of Health, 2021).

Data analysis

Data analysis was conducted in R (R Core Team, 2019) and findings were predominately presented descriptively. These included estimates of prevalence of distress; the episode rate of distress-related interactions; timing, frequency and the type of health service contact; and outcomes.

Denominators used for prevalence estimates and episode rates were calculated based on the estimated size of the construction industry, and extracted from data available from the Queensland Government Statistician’s Office (QGSO, https://www.qgso.qld.gov.au/).

Some data was unavailable for the last six months of the cohort identification period due to variations in data extraction processes across organisations. This missing data was estimated using an autoregressive integrated moving average model to provide prevalence estimates.

Data on health characteristics is primarily reported in relation to International Classification of Diseases (ICD) 10th revision codes. These codes are used within health systems to document health conditions in a standardised way that allows for consistent comparisons across time and settings. Though subject to tailoring across jurisdictions (i.e. Australia uses ICD-10-AM), a general list of codes can be found online (https://icd.who.int/browse10/2019/en). For the purposes of this report, the following ICD-10 codes are particularly relevant:

- Chapter V Mental and behavioural disorders (F00-F99 codes - F coded presentations)
- Chapter XIX Injury, poisoning and certain other consequences of external causes (S00-S99 and T00-T98 codes - S&T coded presentations)
- Chapter XVII Symptoms, signs and abnormal clinical and laboratory findings not elsewhere classified (R00-R99 codes - R coded presentations)
- Chapter XI Diseases of the digestive system (K00-K93 codes - K coded presentations)

- Chapter XX External causes of morbidity and mortality (V01-Y98 codes - V-Y coded presentations)
- Chapter XXI Factors influencing health status and contact with health services (Z00-Z99 codes - Z coded presentations).

F coded presentations include mental illnesses (e.g. depressive or anxiety disorders), personality disorders (e.g. borderline personality disorders), substance use disorders, and neurocognitive and neurodevelopmental disorders (e.g. cognitive impairment, attention deficit hyperactivity disorders, autism spectrum disorders and dementia). For ease of communication, mental health diagnoses have been mapped from ICD codes to those based on the Diagnostic and Statistical Manual 5th edition (American Psychiatric Association).

S&T coded presentations include injuries and poisonings. However, the coding is only used to describe the nature of the injury or poisoning, and does not assign intent. Therefore, these include presentations that were unintentional or intentional in nature (including intentional self-harm or the impacts of an assault), but do not distinguish between these causes. Information regarding cause and intent is provided in the coding of the V-Y codes, as well as X codes, although these are applied inconsistently. Intentional self-harm hospitalisations can be identified based on a combination of codes in one of the linked datasets (QHAPDC). This attribution is based on Australian Institute of Health and Welfare definitions. Specifically, a presentation was determined to be a result of intentional-self harm if the person received a principal diagnosis ICD-10 code in the chapter range of S00-T75 "Injury, poisoning, and certain other consequences of external causes" and the first reported external cause code is in the ICD-10 code range of X60-X84 (intentional self-harm) OR Y87.0 (Australian Institute of Health and Welfare, 2024).

R coded presentations include a range of unrelated codes that are applied when other specific conditions cannot be identified. It includes R45.81 – suicidal ideation, which is only applied if another specific code, including an F code, does not apply.

The K codes include codes related to the digestive system. This incorporates diseases of the liver, including those that may be alcohol related.

V codes are another injury-related categorisation. These are not considered in the overall analysis of injuries presented in this report as they included a relatively small number of additional people and interactions.

Z codes include a range of codes and can be applied to cases where a consultation is not completed (e.g. someone leaves prior to completing an assessment) and another specific diagnosis cannot be applied.

Categorisation of mental health diagnoses and the use of mental health services builds on classifications reported elsewhere (Meurk et al., 2024). For the purposes of this analysis, unless otherwise stated, the term 'mental health related interactions with health services' includes mental health (F-coded or MPDS25) presentations to emergency departments, Queensland hospitals, QAS and Authorised Mental Health Services (public mental health services).

To ensure health service interactions were not artificially inflated due to COVID-19, data was adjusted to count people separately if their only record of a presentation to a health service was for a reason related to COVID-19. This was applied to QHNAPDC and QAS datasets as these were the only datasets where this impact was noticeable. Negligible records due solely to COVID-19 were identified in EDC.

Analysis of health service interactions before and after a distress-related interaction with a construction industry organisation was conducted using a seven-day moving-average model.

Qualifications and limitations

All references to the 'first distress-related interaction' with a construction industry organisation refer to interactions which occurred from 1 January 2018 to 31 December 2020. These people may have contacted the organisations before 2018, but this data was not explored in this study.

Each contributing construction industry organisation records and stores information differently. However, this is unlikely to affect prevalence estimates of distress interactions as these were based on, and limited to, one episode per person per calendar year. However, it does mean that the episode rate is likely an underestimate of the true distress-related episode rate in Queensland.

The participating construction industry organisations have a broad reach in their respective roles. However, a low overlap in interactions across these organisations potentially means the estimates would increase, possibly markedly, if further construction industry organisations were included.

Like construction organisations, each health service datasets records and labels information differently, including in the way it records information that can be used to measure the use of health services. In some cases, a maximum of one interaction with a health service per day per person was counted in the study. This approach prevented duplication of recording in some data sets and avoided inflating the number of interactions someone had with the health system. As a result, resourcing implications of attendances will be underestimated in some cases. For this report, the following interpretations apply when referring to contacts or interactions with a health service:

- EDC, CIMHA and QHNAPDC – record or presentation refers to an interaction with a service (or a provision of service in CIMHA), limited to one interaction per person per day
- QHAPDC – record or presentation refers to an admission
- QAS – record refers to an attendance by one or more units.

The data used for analysis of mental health diagnoses was extracted from CIMHA. This dataset provides a comprehensive repository for data relating to people who access public mental health services in Queensland. However, Australia operates within a federated system of government, with both the states and federal government, as well as the private sector through private health insurance, providing funding to different parts of the health system. In relation to mental health care, this creates a broad division where common mental health conditions such as mild-moderate depressive, anxiety or substance use problems are more likely to be treated by primary care and private specialist service providers, which are subsidised by federal funding, while less prevalent and more serious mental health conditions are more likely to be treated by public mental health services. Consequently, data is likely to show higher accuracy for population prevalence of less common mental illnesses and lower accuracy for population prevalence of more common mental illnesses (Grace et al., 2015). For QAS, MPDS codes should not be considered a definitive diagnosis. MPDS 25 attendances (identified as psychiatric/abnormal behaviour/suicide attempt) represent an undercount of the true number of mental health related presentations attended by the QAS.

Findings relating to injury and poisoning presentations which are identified as being due to intentional self-harm are measured based on variables contained in the QHAPDC dataset only. As outlined below, injury and poisoning presentations were more prevalent in the EDC dataset. This data could not be used to identify intentional self-harm presentations due to limitations in reporting known to impact on the identification of suicidality within emergency department datasets (Sveticic et al., 2020). There is likely to be some similarities between the findings from QHAPDC and EDC in terms of the patterns identified. However, the prevalence of intentional self-harm reported here will be an undercount.

Results

Dataset overview

Table 1 shows the number of people who interacted with a construction industry organisation for distress during the study period. In total, 10,548 individuals had a distress-related interaction between 1 January 2018 and 31 December 2020. This equates to more than nine construction workers per day. The table describes the cohort and the organisations where people had their first (or any) distress-related interaction. Approximately 3% of people had a distress-related interaction with two or more construction industry organisations.

Table 1 Cohort dataset overview.

Construction industry organisation	People, first interaction for distress (n)	People, any interactions (n)
BERT	207	255
BUSSQ	6,530	6,718
MATES	1,185	1,245
WorkCover Queensland	2,626	2,668
Total unique	**10,548**	**10,886**

Table 2 provides an overview of the cohort selection process which was based on field codes or keywords. Reasons for inclusion included issues of coping, alcohol or drug related distress, psychological distress (including mental health problems and suicidality), a need for compassionate support, relationship issues or financial hardship.

Table 2 Reason for inclusion in cohort.

Inclusion criteria[1]	BERT[2]	WorkCover Queensland[2]	BUSSQ[2]
Issues with coping identified	8	1,129	
Alcohol or drug-related	7	440	
Psychologically related, including mental health and suicidality	29	614	4,624
Relationship issues identified	25	502	
Compassionate grounds	-	-	544
Financial hardship identified	176	-	1,641
Other	21	7	NA[3]

[1] '-' indicates the word or field was not used as part of the search criteria in that organisation.

[2] Counts represent number of people with the field or keyword identified with their case. People can have multiple keywords. To preserve privacy in relation to free text data, BUSSQ keyword searching was not disaggregated by thematic area.

[3] Counts included in 4,624 figure above.

Prevalence and episode rate

Table 3 shows the 12-month prevalence rate of distress-related interactions between people in the construction industry and the four organisations. This prevalence ranged between 1.72% and 1.83% during the period examined. The table shows a peak in 2019 with stable rates either side.

Table 3 Twelve-month prevalence.

Year	Number of people who had a distress-related interaction[3]	Number of construction workers in Queensland[1]	% of construction workers in Queensland who had a distress-related interaction with construction industry organisations	95% Confidence interval
2018	4,169	239,400	1.74%	1.69 - 1.79
2019	4,329	236,600	1.83%	1.78 - 1.88
2020	4,232[2]	246,300	1.72%	1.67 - 1.77

[1] Population number sourced from the Queensland Government Statistician's Office.

[2] Adjusted to account for missing data.

[3] Individuals are counted a maximum of once per year.

Table 4 shows the three-year pooled prevalence of distress-related interactions divided by the smallest and largest population denominator over the period examined. It shows between 4.38% and 4.56% of the cohort had at least one distress-related interaction with a construction industry organisation.

Table 4 Three-year pooled prevalence.

Rate estimation	Number of people who had a distress-related interaction over a three-year period[1]	Number of construction workers in Queensland	% of construction workers in Queensland who had a distress-related interaction with construction industry organisations	95% confidence interval
Maximum	10,796[2]	236,600	4.56%	4.48 - 4.65
Minimum	10,796[2]	246,300	4.38%	4.3 - 4.46

[1] Population number sourced from the Queensland Government Statistician's Office.

[2] Adjusted to account for missing data.

Table 5 shows the rate of interactions with each organisation. Interactions were counted as a maximum of one per day per organisation, regardless of the number of interactions within a single day. Consistent with the above-mentioned rates in Table 3, the episode rate shows a spike of interactions in 2019 with relative stability in 2018 and 2020.

Table 5 Twelve-month episode rate.

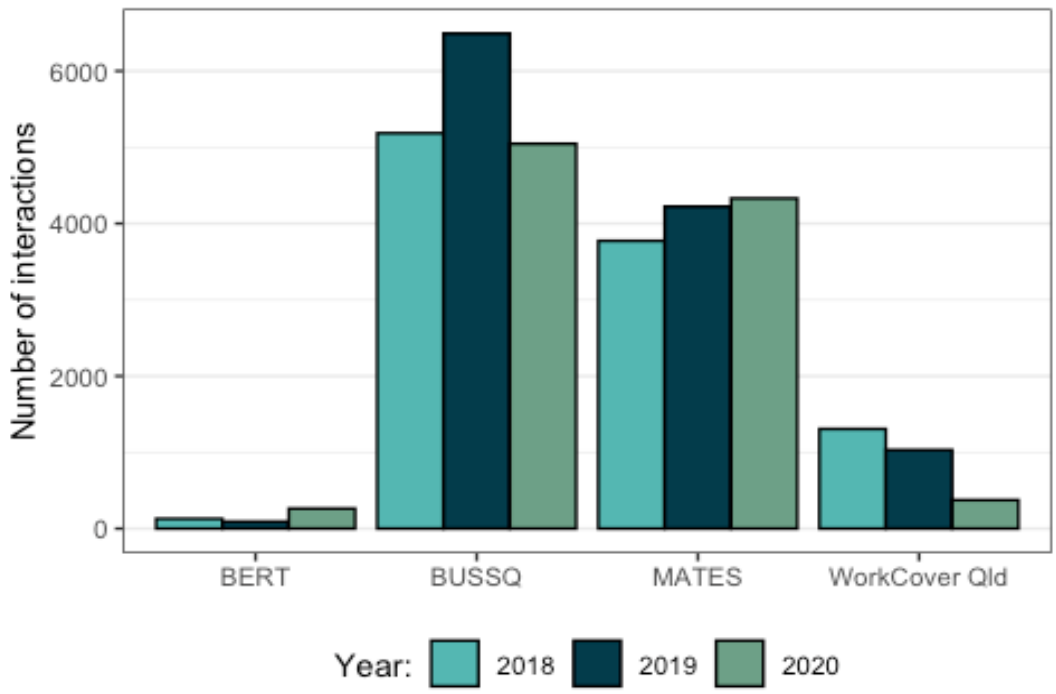
Year	Number of distress-related interactions	Number of construction workers in Queensland[1]	% of distress-related interactions from construction worker population per year	95% confidence interval
2018	8,259	239,400	3.45%	3.38 - 3.52
2019	9,472	236,600	4%	3.92 - 4.08
2020	8,594[2]	246,300	3.49%	3.42 - 3.56

[1] Population number sourced from the Queensland Government Statistician's Office.

[2] Adjusted to account for missing data.

Despite the overall stability in interactions in 2018 and 2020, Figure 3 shows variability across organisations. Specifically, BERT and MATES experienced increased interactions during 2020, while BUSSQ and WorkCover Queensland experienced reductions.

Figure 3. Number of interactions by organisation, per year. *



*Interactions with BERT during 2020 are undercounted.

Demographic profile

The demographic profile of the cohort is shown in Table 6 and was predominately male with a mean age of 40 at the time of their interaction for distress. A total of 6.5% identified as having an Aboriginal and/or Torres Strait Islander background.

Table 6 Demographic profile of cohort

Demographic	Female	Male	Overall
% (n) cohort	5.6% (n = 591)	94.4% (n = 9,957)	10,548
Age at index (median)	42	40	40
Aboriginal and/or Torres Strait Islander background % (n)	6.1% (n = 36)	6.5% (n = 652)	6.5% (n = 688)

Health services records

Overall, 152,610 health records were identified from 1 January 2017 to 31 December 2021 and this encompassed one year either side of the cohort period. Table 7 shows the cohort's total use of health services over five years. The majority had at least one interaction with a Queensland hospital (emergency department, public or private inpatient admission), while almost 40% were attended by the QAS. Females appeared to have lower rates of interaction with emergency departments and mental health services, but higher rates of interaction with other services, compared to males.

Table 7 Health service interactions dataset overview.

Health services	Individuals	Records	Female	Male
Emergency departments (EDC)	71.8% (n = 7577)	27,983	67.3% (n = 398)	72.1% (n = 7,179)
Hospital admissions (QHAPDC)	61.8% (n = 6520)	24,416	67.9% (n = 401)	61.5% (n = 6,119)
Non-admitted hospital presentations (QHNAPDC[1)]	48.8% (n = 5148)	49,993	56.7% (n = 335)	48.3% (n = 4,813)
Attendances by Queensland Ambulance Service (QAS)[1]	39.4% (n = 4156)	10,273	42.3% (n = 250)	39.2% (n = 3,906)
Public mental health services (CIMHA)	14.0% (n = 1478)	33,652	12% (n = 71)	14.1% (n = 1,407)
COVID-19 only	4.7% (n = 500)	6,1871	5.1% (n = 30)	4.7% (n = 470)
Deaths (QDR)	1.0% (n = 106)	-	1.0% (n = 6)	1.0% (n = 100)

[1]Excludes COVID-19 only presentations.

Mental health profile

Mental health profiles were examined based on recorded diagnoses in CIMHA. Only 14% had an interaction with these services, but some did not receive a diagnosis. Overall, 6.9% (n=723) of the total cohort had at least one mental health diagnosis recorded in CIMHA (Table 8) and the largest diagnosis category was mental illness, followed by substance-related and addictive disorders. The most common diagnoses were substance use, trauma and stressor related, and depressive disorders.

Table 8 Mental health diagnosis, reported as a percentage of people interacting with a public mental health service and in reference to the total cohort.

Mental health category	Number within total cohort	% with a public mental health service interaction	% total cohort
Mental illness	**619**	**85.6%**	**5.9%**
Trauma and stressor related disorders	287	39.7%	2.7%
Trauma disorder	226	31.3%	2.1%
Acute and other reaction to stress	87	12.0%	0.8%
Depressive disorders	221	30.6%	2.1%
Schizophrenia spectrum and other psychotic disorders	162	22.4%	1.5%
Psychotic disorders - schizophrenia	88	12.2%	0.8%
Psychotic disorders - substance induced	76	10.5%	0.7%
Psychotic disorders - acute and transient	45	6.2%	0.4%
Psychotic disorders - other	17	2.4%	0.2%
Other mental illness	124	17.2%	1.2%
Anxiety disorders	102	14.1%	1.0%
Bipolar and related disorder	46	6.4%	0.4%
Substance related and addictive disorders	**385**	**53.3%**	**3.6%**
Substance use disorders	321	44.4%	3.0%
Substance induced disorders	87	12.0%	0.8%
Substance use (other)	69	9.5%	0.7%
Personality disorder	**105**	**14.5%**	**1.0%**
Other personality disorders	53	7.3%	0.5%
Borderline personality disorder	43	5.9%	0.4%
Antisocial personality disorder	28	3.9%	0.3%
Other[1]	**28**	**3.9%**	**0.3%**

[1]Includes neurocognitive and neurodevelopmental disorders.

Health characteristics

Queensland Ambulance Service

Table 9 includes the most common Medical Priority Dispatch System (MPDS) codes for attendances by the QAS. For those people who were attended by the QAS, 15.3% had chest pain, 14.6% were coded as psychiatric/abnormal behaviour/suicide attempt and 14.4% had traumatic injuries. When examining QAS attendances, psychiatric/abnormal behaviour/suicide attempts were the most common overall.

Table 9 Ten most common Medical Priority Dispatch System (Queensland Ambulance Service) codes.

Medical Priority Dispatch System (MPDS)[1]	Number of people attended by Queensland Ambulance Service	% attended by Queensland Ambulance Service	% of total cohort	% (n) of records
Non-specific MPDS code[2]	898	21.2%	8.5%	11.3% (n = 1,158)
10: Chest pain (non-traumatic)	646	15.3%	6.1%	8.9% (n = 911)
25: Psychiatric/abnormal behaviour/suicide attempt	618	14.6%	5.9%	10.2% (n = 1,051)
30: Traumatic injuries (specific)	609	14.4%	5.8%	6.8% (n = 694)
29: Traffic/transportation Incidents	602	14.2%	5.7%	6.3% (n = 645)
17: Falls	490	11.6%	4.6%	5.8% (n = 598)
26: Sick Persons (specific diagnosis)	437	10.3%	4.1%	5.4% (n = 554)
4: Assault/sexual assault	367	8.7%	3.5%	4.1% (n = 423)
31: Unconscious/fainting (near)	349	8.2%	3.3%	4.0% (n = 413)
1: Abdominal pain	328	7.8%	3.1%	4.8% (n = 490)

MPDS: Medical Priority Dispatch System. This code is assigned by the Emergency Medical Dispatcher at point of call to 000. It should not be considered a definitive diagnosis. MPDS = 25 (psychiatric/abnormal behaviour/suicide attempt) may not accurately represent the true number of mental health-related attendances by QAS to people in this cohort over this period.

[1]Code 36 removed - Pandemic/epidemic/outbreak.

[2]In this report “non-specific MPDS codes” are used to describe interhospital transfers, aeromedical retrievals, medically authorised transfers, etc. (e.g. where a patient is transferred from a GP to a hospital). Where these codes are recorded, the underlying reason for ambulance attendance is not captured.

Emergency departments

Table 10 includes the most common interactions with emergency departments (ED) by ICD-10 code. For those people who visited an ED, almost 65% required treatment for injuries, poisoning and certain other consequences of external causes. Almost half of the total cohort (46.5%) visited an ED for this reason. These interactions primarily related to injuries rather than poisonings (see Appendix). The second category in Table 10 (R00-R99) includes the code R45.81 – suicidal ideation. A total of 19.6% of people in this category visited an ED for this reason. Additionally, 60 individuals (<1%) visited due to X60-84 (self-harm). When examining ED presentations, mental and behavioural disorders were the third most frequent presentation type.

Table 10 Ten most common ICD-10 presentation codes for people visiting emergency departments.

ICD10 Chapter	Number of people	% emergency departments	% cohort	% (n) records
Injury, poisoning and certain other consequences of external causes (S00-T98)	4,910	64.8%	46.5%	34.1% (n = 9,539)
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00-R99)	2,474	32.7%	23.5%	16.3% (n = 4,559)
Factors influencing health status and contact with health services (Z00-Z99)	1,237	16.3%	11.7%	6.4% (n = 1,785)
Diseases of the musculoskeletal system and connective tissue (M00-M99)	1,223	16.1%	11.6%	6.0% (n = 1,675)
Diseases of the digestive system (K00-K93)	1,118	14.8%	10.6%	5.9% (n = 1,658)
Mental and behavioural disorders (F00-F99)	954	12.6%	9.0%	6.8% (n = 1,910)
Certain infectious and parasitic diseases (A00-B99)	834	11.0%	7.9%	3.6% (n = 1,008)
Diseases of the skin and subcutaneous tissue (L00-L99)	832	11.0%	7.9%	4.3% (n = 1,191)
Diseases of the circulatory system (I00-I99)	813	10.7%	7.7%	4.4% (n = 1,238)
Diseases of the respiratory system (J00-J99)	629	8.3%	6.0%	2.1% (n = 840)

Queensland hospital admissions

Table 11 shows the most common reasons for admission to a Queensland hospital. People were most frequently admitted for injuries followed by diseases of the digestive system and musculoskeletal system.

Table 11 Ten most common admission diagnoses for Queensland hospitals.

ICD10 Chapter	Number of people with an admission diagnosis	% QHAPDC	% cohort	% (n) record
Injury, poisoning and certain other consequences of external causes (S00-T98)	2,572	39.4%	24.4%	16.3% (n = 3,978)
Diseases of the digestive system (K00-K93)	1,567	24.0%	14.9%	10.2% (n = 2,480)
Diseases of the musculoskeletal system and connective tissue (M00-M99)	1,554	23.8%	14.7%	10.9% (n = 2,671)
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00-R99)	1,543	23.7%	14.6%	9.6% (n = 2,354)
Factors influencing health status and interaction with health services (Z00-Z99)	741	11.4%	7.0%	15.7% (n = 3,824)
Mental and behavioural disorders (F00-F99)	633	9.7%	6.0%	8.9% (n = 2,178)
Diseases of the circulatory system (I00-I99)	567	8.7%	5.4%	5.1% (n = 1,237)
Neoplasms (C00-D48)	548	8.4%	5.2%	4.1% (n = 993)
Diseases of the skin and subcutaneous tissue (L00-L99)*	493	7.6%	4.7%	2.9% (n = 697)
Diseases of the genitourinary system (N00-N99)	489	7.5%	4.6%	3.1% (n = 758)

*When admissions were examined, diseases of the nervous system (G00-G99) were the ninth most common presentation.

Queensland hospital non-admitted patients

Table 12 shows the most common non-admitted hospital clinic codes. Consistent with the prominence of injuries and musculoskeletal conditions, orthopaedic services were the most common clinic code (both in terms of individuals who received this service and overall interactions), followed by surgery-related codes and physiotherapy.

Table 12 Ten most common non-admitted hospital clinic codes.

Type of service	Number of people	% QHNAPDC	% cohort	% (n) records
Orthopaedics	2,099	40.8%	19.9%	15.4% (n = 7,713)
General surgery	1,334	25.9%	12.6%	7.1% (n = 3,526)
Pre-admission and pre-anaesthesia	1,201	23.3%	11.4%	4.0% (n = 1,992)
Physiotherapy	1,021	19.8%	9.7%	8.9% (n = 4,442)
Clinical measurement	986	19.2%	9.3%	5.4% (n = 2,679)
Clinical pharmacy	713	13.9%	6.8%	3.0% (n = 1,479)
Anaesthetics*	697	13.5%	6.6%	2.0% (n = 978)
Gastroenterology	619	12.0%	5.9%	3.1% (n = 1,547)
Occupational therapy	561	10.9%	5.3%	3.5% (n = 1,773)
Endoscopy – gastrointestinal*	530	10.3%	5.0%	1.5% (n = 769)

QHNAPDC: Queensland Hospital Non-admitted Patient Data Collection.
*Radiation therapy and cardiology replace these items when attendances are examined.

Health services use

Timing and pathways

Figure 4 depicts the timing of health service contacts in the 10 weeks before and after the first distress-related interaction with a construction industry organisation. This shows a steep increase in the use of health services in the seven to 14 days leading up to the interaction and a subsequent steep decrease immediately afterwards. However, the average number of health service contacts per day increases after the distress-related interaction.

Figure 4. Use of health services 10 weeks before and after the first distress-related interaction with a construction industry organisation.

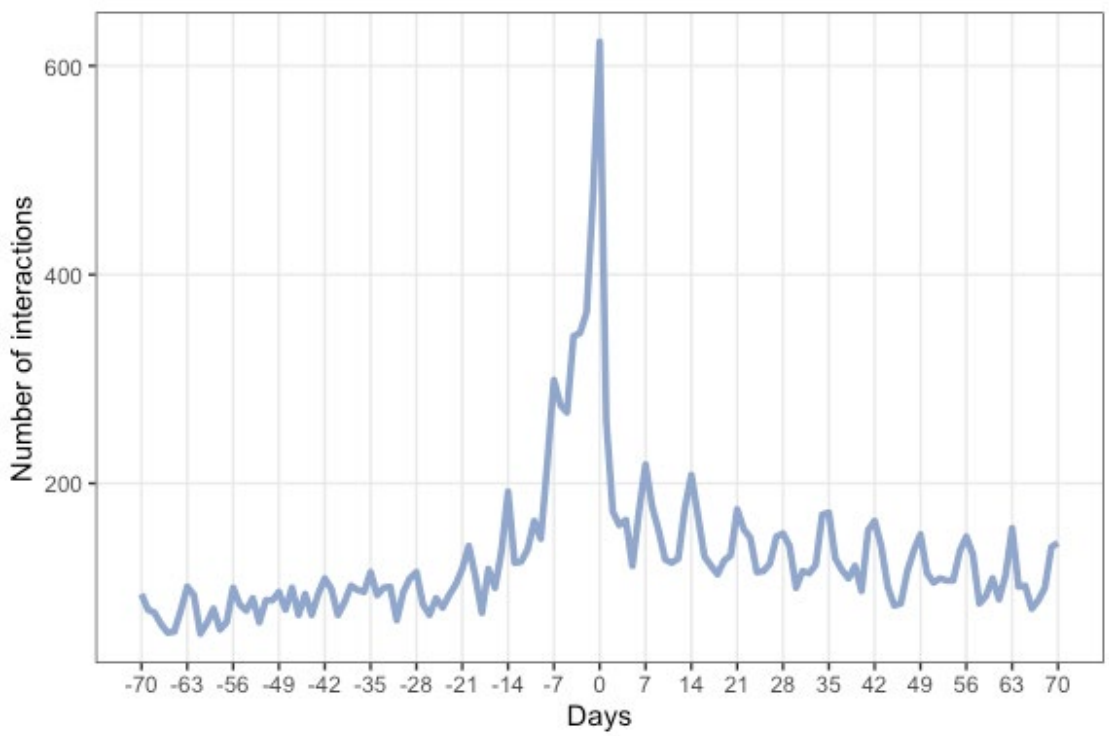


Table 13 shows how people interacted differently with health services in the 14 days before and after their first distress-related interaction with a construction industry organisation. More people contacted emergency departments, hospitals and the QAS before a distress-related interaction than afterwards. Accessing non-admission hospital services and public mental health services after expressing distress was more common than using these services beforehand. While accessing emergency departments was the most common type of health service contact in the 14 days before a distress-related interaction, use of non-admission hospital services was more frequent afterwards. Contact with mental health services was rare in the 14 days beforehand, but was the second most common interaction in the following fortnight.

Table 13 Interactions with health services 14 days before and after the first distress-related interaction.

Health services	Before index[1]	Same day as index[1]	After index[1]
Emergency departments	19.8% (n = 1278)	3.2% (n = 207)	5.2% (n = 334)
Hospital admissions	11.0% (n = 708)	2.9% (n = 190)	7.4% (n = 478)
Mental health services	5.9% (n = 380)	0.8% (n = 49)	7.7% (n = 497)
Non-admitted patients	9.9% (n = 639)	1.5% (n = 95)	14.4% (n = 930)
Queensland Ambulance Service	7.3% (n = 471)	1.3% (n = 82)	2.0% (n = 127)
Overall	53.8% (n = 3476)	9.6% (n = 623)	36.6% (n = 2,366)

[1]Proportions are calculated based on the total number of interactions 14 days before and after the first distress-related interaction (n = 6,465).

Injury-related presentations to emergency departments (S00-T98) were the most common health service interactions in the seven to 14 days before someone articulated distress to a construction industry organisation. A total of 49.7% of the cohort had an S00-T98 related interaction during the five-year study period. Of those who had an injury-related presentation, 64% (n=3357) had their first injury before their first distress interaction. Approximately 40% (n=1363) of people who had a S00-T98 presentation before their distress interaction also had another S00-T98 presentation afterwards.

Figure 5 applies a moving-average model to the interactions data shown in Figure 4. Once the interactions on day zero are removed, a seven-day moving-average of 123 presentations per day in the 10 weeks before the distress-related interaction was evident and this increased to 137 presentations per day in the following 10 weeks. This is an approximate 10% increase.

Figure 5. Moving-average model applied to presentation data before and after a distress-related interaction.

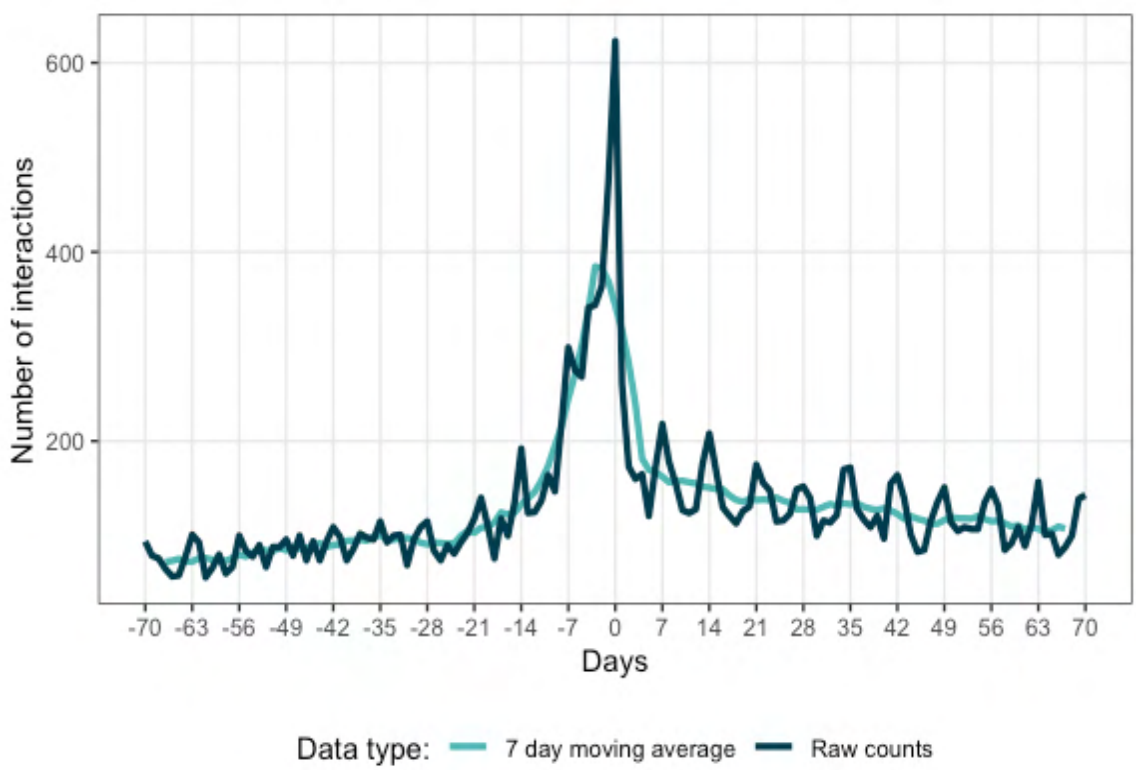
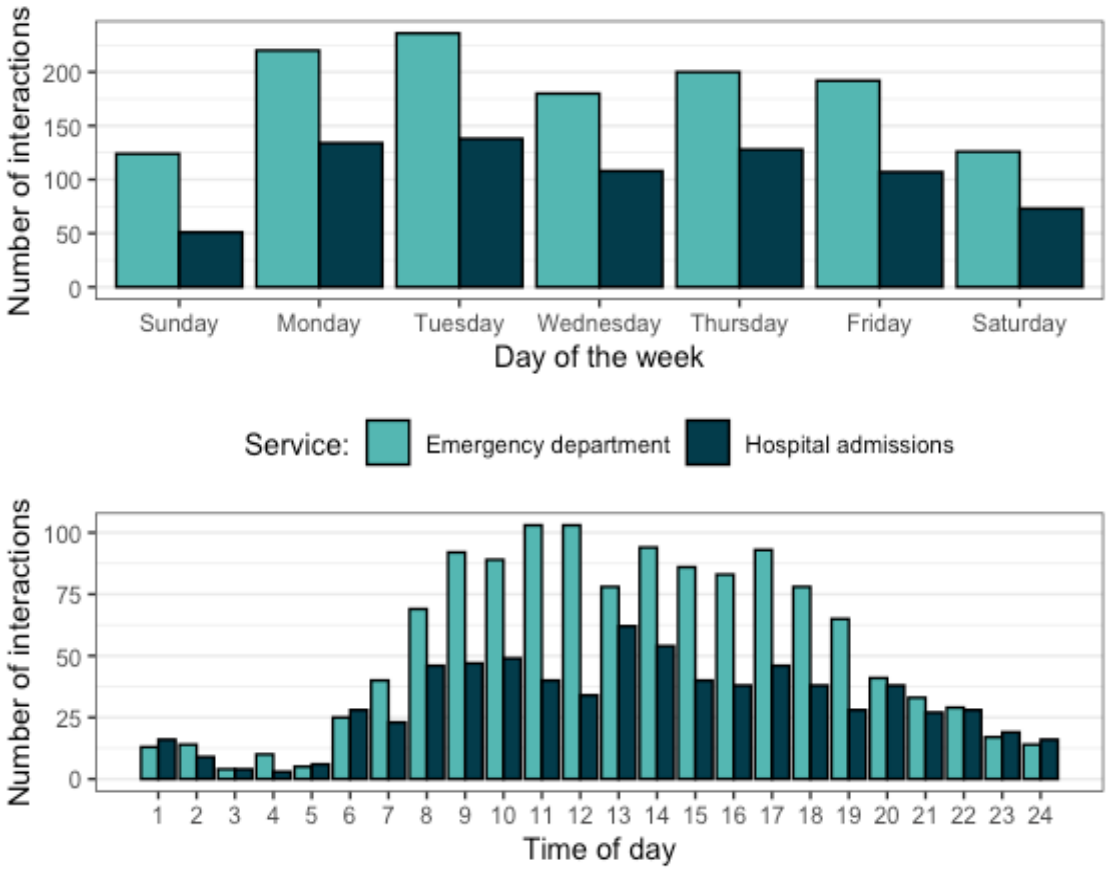


Figure 6 shows the timing of visits to EDs and hospitals in the 14 days before and after someone's first distress-related interaction with a construction industry organisation, by time and day of the week. The most common days for presentations were Mondays and Tuesdays, and the peak time for presentations was around midday (11am - 12noon inclusive) for EDs and 1-2pm (inclusive) for hospital admissions.

Figure 6. Presentations to emergency departments and Queensland hospitals in the 14 days before and after a distress-related interaction with a construction industry organisation, by time and day of the week.



Use of mental health services

A total of 17.5% (n =1843) of the cohort had at least one mental health related interaction with a health service, including a public mental health service, an ED F-coded presentation, or an attendance by the QAS with an MPDS25 dispatch. Table 14 shows the most common type of interaction was related to acute care services, including acute care and mental health co-responder (police-mental health or ambulance-mental health) teams.

Table 14 Breakdown of mental health related services interactions according to type.

Mental health related service contacts	Number of people	% MHS	% cohort
Bed based	**771**	**41.8%**	**7.3%**
Hospital admitted inpatient	768	41.7%	7.3%
Residential care	85	4.6%	0.8%
Clinical ambulatory	**1,115**	**60.5%**	**10.6%**
Specialised mental health services	761	41.3%	7.2%
Community mental health services	705	38.3%	6.7%
Hospital outpatient non-admitted	601	32.6%	5.7%
Acute Care Services	**1,407**	**76.3%**	**13.3%**
Acute Care Teams	1,074	58.3%	10.2%
Co-responder/crisis models	979	53.1%	9.3%
Alcohol and other drug	**25**	**1.4%**	**0.2%**
Outpatient alcohol and other drugs service	25	1.4%	0.2%
Opioid replacement therapy	24	1.3%	0.2%
Emergency department (F-Code)	**954**	**51.8%**	**9.0%**
Queensland Ambulance Service (MPDS 25: Psychiatric/abnormal behaviour/suicide attempt)[1]	**618**	**33.5%**	**5.9%**

[1]This estimate will undercount the true number of mental health related attendances by QAS.

Injury related presentations and intentional self-harm

The findings show a relationship between injury-related presentations (intentional or unintentional) to EDs and hospitals, and distress-related interactions with construction industry organisations.

Chapter S00-T98 presentations by year

Table 15 shows the number of S00-T98 interactions with EDs and Queensland hospitals from 1 January 2018 to 31 December 2020. It identifies a decline in the number of people treated for injuries as well as injury-related interactions during the three-year period.

Table 15 S00-T98 admissions by year.

Year	Number of people	Number of presentations
2018	1,906	3,254
2019	1,819	3,102
2020	1,519	2,578

Hospital admissions due to intentional self-harm

The proportion of injury and poisoning-related admissions due to intentional self-harm were examined in QHAPDC records using the Australian Institute of Health and Welfare classification of intentional self-harm (S00-T75 plus reported external cause code in the range of X60-X84 or Y87.0). Table 16 shows nearly 5.9% of people who had an admission recorded in the range of S00-T75 were identified as having at least one admission due to intentional self-harm, while 5.3% of all presentations were due to this reason.

Table 16 Proportion of people and records with a hospital admission diagnosis in the range of S00-T75, disaggregated by intentional or unintentional self-harm causes.

Counts	S00-T75 admissions not due to intentional self-harm[3]	Admissions due to intentional self-harm[3]
% (n) people[1]	96.7% (n = 2,334)	5.9% (n = 143)[4]
% (n) records[2]	94.7% (n = 3,373)	5.3% (n = 188)[5]

[1]Proportions are calculated from the total number of people with the ICD10 range 'S00-T75' (22.9%, n = 2,413 of cohort).

[2]Records are counted by the total number of principal diagnoses with ICD10 codes as self-harm related. Proportions are calculated from the total records of S00-T75 ICD10 code range admissions (n = 3,561).

[3]People can be double counted across categories.

[4]Values in this row do not add up to 100% due to some people having both types of admissions.

[5]Values in this row add up to 100% because records can only be classified as intentional self-harm or not intentional self-harm.

Table 17 shows important differences between people who:

- did not having an injury-related hospital admission
- had an injury-related hospital admission that was not due to intentional self-harm
- had an injury-related admission that was due to intentional self-harm.

People who had an injury-related hospital admission were slightly younger than those who were admitted for another reason. Sex-based findings showed more males than females had an injury-related admission. However, females had a relatively higher proportion of injuries due to intentional self-harm than males. People who had an Aboriginal and/or Torres Strait Islander background appeared to be relatively over-represented among those who had an injury-related admission.

There was also a marked increase in the prevalence of mental health diagnosis among people who had a S00-T98 presentation, regardless of whether this was due to intentional self-harm or not.

Prevalence of death, due to all causes, was markedly higher among people who were admitted due to intentional self-harm in comparison to those who had either no S00-T98 related admission or an injury-related (but not intentional self-harm related) admission. Prevalence of death appeared to be similar for these latter two groups.

Table 17 Disaggregation of admissions, by an injury or poisoning-related admission with or without evidence of intentional self-harm (ISH).

	Injury (S00-T98)		
Demographic	Number of injuries	Injury without ISH	Injury and ISH
% (n) Cohort	77.1% (n = 8,135)	23.7% (n = 2,495)	1.4% (n = 143)
Age (median)	41	38	39
Male	93.8% (n = 7,632)	96.0% (n = 2,394)	93.0% (n = 133)
Female	6.2% (n = 503)	4.0% (n = 101)	7.0% (n = 10)
Aboriginal and/or Torres Strait Islander	6.0% (n = 492)	8.1% (n = 202)	14.0% (n = 20)
Mental health diagnosis	5.2% (n = 419)	10.6% (n = 264)	65.0% (n = 93)
Died (any cause)	1.0% (n = 84)	0.8% (n = 21)	5.6% (n = 8)

Outcomes

Hospital admissions for intentional self-harm

More people were hospitalised or treated in ED for injury or poisoning before their first distress-related interaction with a construction industry organisation than afterwards. However, Table 18 shows hospitalisations for intentional self-harm followed a different pattern with higher numbers admitted

after a distress-related interaction. The findings identified people were either hospitalised for this reason before or after their first distress-related interaction, but rarely in both situations.

Table 18 S00-T75 and intentional self-harm before and after the first distress-related interaction with a construction industry organisation.

	Before first interaction[1]	After first interaction[1]
% (n) People[2]	46.9% (n = 67)	58.7% (n = 84)
% (n) People's first ISH hospitalisation	46.9% (n = 67)	53.1% (n = 76)
Number of hospitalisations[3]	77	111

[1]Proportion is calculated based on the number of people with intentional self-harm hospitalisation (n = 143). Note, as outlined in the qualifications and limitations section, data is based on Queensland hospitals admissions but not Emergency Data Collection. While there is likely to be similarities in patterns, the overall prevalence will be an underestimate.

[2]People can be counted across both time points.

[3]Records counted by the total number of unique event identifiers.

There was a median period of 338 days between hospitalisation for self-harm and a subsequent distress-related interaction. An average of 434 days elapsed between an initial expression of distress and a subsequent hospitalisation for self-harm.

Deaths

As shown in Table 19, a total of 1% of the cohort died over the four-year period from 1 January 2018 to 31 December 2021. The median age of those who died was 50 years and 7.5% of these people had been hospitalised for intentional self-harm, while 11% had received a mental health diagnosis.

Table 19 Demographic details for people who died from 1 January 2018 to 31 December 2021.

Demographic	Alive	Died
% (n) Cohort	99.0% (n = 10,442)	1.0% (n = 106)
Age at first distress interaction (median)	40	50
Female % (n)	5.6% (n = 585)	5.7% (n = 6)
Male % (n)	94.4% (n = 9,857)	94.3% (n = 100)
Aboriginal and/or Torres Strait Islander % (n)	6.5% (n = 683)	-
Mental health diagnosis % (n)	6.8% (n = 711)	11.3% (n = 12)
S00-T98 ICD chapter presentation[1] % (n)	49.8% (n = 5,203)	47.2% (n = 50)
Intentional self-harm hospitalisation % (n)	1.3% (n = 135)	7.5% (n = 8)

[1]Includes both hospital admissions and emergency department presentations.

Table 20 shows the most common causes of death were diseases of the circulatory system followed by neoplasms (i.e. cancers). Cancers of digestive organs were the most common, and suspected suicide was the third most prevalent cause of death, followed by diseases of the digestive system. In this latter group, diseases of the liver (K70-K77) relating to alcohol use and/or cirrhosis accounted for the majority (n=11) of deaths. Causes of death attributable to mental and behavioural disorders were predominately related to alcohol use.

Table 20 Ten most common causes of death.

ICD10 Chapter	% (n)[1]
Diseases of the circulatory system (I00-I99)	29.2% (n = 31)
Neoplasms (C00-D48)	28.3% (n = 30)
Suspected suicide death[2]	24.5% (n = 26)
Diseases of the digestive system (K00-K93)	13.2% (n = 14)
Diseases of the respiratory system (J00-J99)	11.3% (n = 12)
Mental and behavioural disorders (F00-F99)	11.3% (n = 12)
Endocrine, nutritional and metabolic diseases (E00-E90)	9.4% (n = 10)
Certain infectious and parasitic diseases (A00-B99)	5.7% (n = 6)
Diseases of the genitourinary system (N00-N99)	5.7% (n = 6)
External causes of morbidity and mortality (V01-Y98)	5.7% (n = 6)
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00-R99)	5.7% (n = 6)

[1]There are multiple death causes per person. Individuals can be counted more than once across chapters.

[2]ICD10 'X' codes were not available. Coding of suspected suicide were based on terms in the cause of death text.

The median time of death for people who died by suicide was 466 days (approximately 1.25 years) after a distress-related interaction with a construction industry organisation.

Table 21 shows that the period between the last interaction with a health service or construction industry organisation, and death by suicide, ranged from 10 days to approximately six months respectively.

Table 21 Interactions with health services and construction industry organisations prior to death.

Organisation[1]	Suicide % (n)	Median number of days between final interaction and death
EDC	61.5% (n = 16)	26 days
CIMHA	-	10 days
QAS	57.7% (n = 15)	58 days
QHAPDC	57.7% (n = 15)	21 days
QHNAPDC	38.5% (n = 10)	99 days
Construction agency	100.0% (n = 26)	188 days

[1]Interactions on same day as death not counted.

Implications

The intersection of mental health services and distress

Several features of a distress-related interaction, as defined in this project, are notable. Firstly, people who experience distress do not necessarily meet the diagnostic criteria for a mental health disorder or a mental health crisis. Specifically, while a mental health crisis could be a manifestation of distress, not all distress manifests as a crisis.

Secondly, public mental health services, EDs and ambulance services were accessed at low levels for mental health related support, and most were used in the context of a mental health crisis. This may have been caused by a reluctance to seek out these services. However, it is more likely they were unsuitable because the distress was chronic and not generally related to a diagnosed mental health disorder or restricted to a mental health crisis. People may have accessed federally funded mental health services (i.e. general practitioners, psychiatrists or psychologists), but confirming this would require further investigation through additional linkages to Medicare Benefits Schedule and Pharmaceutical Benefits Scheme data.

Link between injuries and distress

The research showed physical injuries occurring in the workplace may precede or follow a distress-related interaction. Overall, there appeared to be a link between injuries and mental health diagnoses. Further research would be needed to make strong claims about the precise cause and effect relationships involved.

Overall, the findings support the growing consensus among mental health researchers about the interconnection between physical, and mental health and safety, including its impacts on suicidality, and the need for holistic responses to support both physical, and psychological health and wellbeing (Favril et al., 2023; Meurk et al., 2024; Scott et al., 2010).

The way forward

The findings from this study highlight three key opportunities to improve both injury-related and distress-related 'touchpoints' within the health system and construction industry.

1. **A partnership approach** between health services and MATES in Construction (QLD & NT) Ltd could help ensure distress is identified earlier and more effectively mitigated, or prevented. This approach should involve close collaboration with emergency departments as they are accessed by most people. Due to the link between injuries and distress, this could also have secondary benefits and reduce injuries overall.

2. **Enhancing connectivity** across the construction industry could drive more innovative and integrated ways to recognise and respond to distress. Comprehensive initiatives that assist employees to identify distress, and facilitate sensitive and appropriate engagement, disclosure and support would further strengthen these approaches.
3. **Providing help at the right time and place** could improve outcomes for people experiencing distress. This could include targeted early interventions when workers attend emergency departments for injuries or initially identify distress with a construction industry organisation. Extending follow-up processes by 12 to 24 months could also help ensure people experiencing worsening distress receive additional and tailored support.
4. **Investigating the links between distress and injury prevention initiatives** could lead to improved workplace health and safety in the construction industry.

Appendix

Emergency department presentations relating to S00-T98 codes

ICD10 S&T Subchapter	Number of people	% S&T Chapter	% cohort
Injuries to the wrist and hand (S60-S69)	1,393	28.8%	13.2%
Injuries to the head (S00-S09)	1,003	20.7%	9.5%
Injuries to the ankle and foot (S90-S99)	781	16.1%	7.4%
Injuries to the knee and lower leg (S80-S89)	760	15.7%	7.2%
Injuries to the abdomen, lower back, lumbar spine and pelvis (S30-S39)	487	10.1%	4.6%
Injuries to unspecified part of trunk, limb or body region (T8-T14)	479	9.9%	4.5%
Injuries to the shoulder and upper arm (S40-S49)	438	9.0%	4.2%
Injuries to the thorax (S20-S29)	362	7.5%	3.4%
Injuries to the elbow and forearm (S50-S59)	348	7.2%	3.3%
Effects of foreign body entering through natural orifice (T15-T19)	346	7.1%	3.3%

Queensland hospital admissions relating to S00-T98 codes

ICD10 S&T Subchapter	Number of people	% S&T Chapter	% cohort
Injuries to the wrist and hand (S60-S69)	651	25.3%	6.2%
Injuries to the head (S00-S09)	408	15.9%	3.9%
Injuries to the knee and lower leg (S80-S89)	352	13.7%	3.3%
Complications of surgical and medical care, not elsewhere classified (T80-T88)	248	9.6%	2.4%
Injuries to the shoulder and upper arm (S40-S49)	229	8.9%	2.2%
Injuries to the abdomen, lower back, lumbar spine and pelvis (S30-S39)	205	8.0%	1.9%
Injuries to the elbow and forearm (S50-S59)	198	7.7%	1.9%
Poisoning by drugs, medicaments and biological substances (T36-T50)	175	6.8%	1.7%
Injuries to the ankle and foot (S90-S99)	174	6.8%	1.6%
Injuries to the thorax (S20-S29)	163	6.3%	1.5%

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