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Article

Psychosocial Safety and Health Hazards and Their Impacts on Offshore Oil and Gas Installations

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Abstract: The offshore oil and gas working environment is an inherently dangerous one, with risks posed to physical safety on a daily basis. One neglected field of research is the added psychosocial stressors present in this environment. This research examined the experiences of offshore oil and gas workers through one-on-one online interviews which were recorded and transcribed. Transcripts were analysed through qualitative software NVivo, which generated themes and patterns for the responses given to questions which were developed through a focus group. The results of the analysis showed that multiple psychosocial stressors are present for this population, such as fear of speaking up, unsatisfactory company-provided facilities, work-life interference, work status, micromanaging, gender harassment and bullying. In addition, interviews identified that production and time pressures along with fatigue can influence accidents and mistakes. Climate factors also cause discomfort, however these are managed according to best practice by organisations. Due to the timing of the study, COVID-19 was a significant stressor for some, but not all, employees. In conclusion, offshore oil and gas workers face multiple stressors in a dangerous environment that may lead to devastating consequences.

Keywords: psychosocial stressors; offshore oil and gas; workplace health and safety; COVID-19

1. Introduction

Australia's Fly-in, Fly-(FIFO) out workforce have been the subject of increasing interest in terms of psychosocial research [1,2], yet workers in the resource sector who are based offshore remain somewhat overlooked in comparison. There has been an increased risk of suicide for onshore FIFO workers over the last ten years [2], however the mental health statistics around the offshore oil and gas workforce are less clear. Added stressors for offshore employees include extreme geographical isolation, longer rosters, extreme weather events such as tropical cyclones, changeable ocean conditions and helicopter travel. COVID-19 also affected travel, roster arrangements and work security for this population. The change in rosters during the pandemic resulted in the National Offshore Petroleum Safety and Environmental Management Authority [3] issuing an alert concerning the psychosocial risks of compacted rosters on the mental wellbeing of offshore workers. Rosters had been amended in an attempt to reduce the risk of transmission, however this meant that workers were spending extended periods of time offshore. Moreover, these changes were made without adequately consulting with the offshore employees.

Due to the identified increased psychological risk to onshore FIFO workers, and the lack of legislation for offshore oil and gas workers in relation to mental health risks, the significance of this study lies mainly in its ability to fill the existing knowledge gap and to identify the effects of poor mental health in this environment. Making psychological health and wellbeing a priority can help contribute to a healthier economy because of mental health's impact on performance and productivity [4,5]. In addition, organisations that provide empowering opportunities for employees

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tend to see higher levels of productivity [6] and reduced costs from employee sickness, disability, deaths, poor performance and poor productivity [7]. Failure to address poor mental health in the workplace also negatively affects attendance and accident rates [8].

Assessing and managing risks should significantly lower intervention costs for psychological issues and can reduce absences from work [9,10]. Findings are not only limited to offshore oil and gas populations, but can be generalized to remote work settings, such as polar research stations, offshore wind facilities and to other maritime settings. The study aimed to identify psychosocial stressors for Australian offshore oil and gas workers and found the presence of multiple psychosocial sources of stress that frequently interact.

2. Materials and Methods

The exploratory qualitative study was conducted in Perth, Australia through one-to-one interviews via Microsoft Teams. To analyse the results, NVivo software was used, which allowed themes to emerge from the interview transcripts. Employees working on offshore oil and gas facilities were recruited due to their lived experiences. Approval for the study was granted by The Human Research Ethics Committee (HREC) (Ethics Approval number HRE2021-0512).

Participants

The sample consisted of two groups: 8 members of a focus group and 29 interviewees, 5 of whom were part of a pilot study, providing a total of 37 participants, 33 of whom were male and 4 who were female. They held various roles throughout the industry and worked for a variety of organisations. The age of participants ranged from 25 years to 60+ years. There were 24 employees with ongoing employment, 6 casual workers and 10 contractors in the sample. All respondents in the study worked 12-hour days, with no days off, while offshore.

Procedure

All interviews were video recorded and transcribed. The questions were formed from a focus group session held prior to the interviews and from a review of published literature. The questions were of an open-ended design, which, according to Creswell [11] enabled respondents to answer as accurately and genuinely as possible. Appendix A contains the questions asked in the focus group and Appendix B details the main study interview questions with changes made after the pilot study.

Analysis

From the transcribed documents, notes were made in a researcher diary. From the transcripts of the video recordings, sections of answers were entered into NVivo, from which themes and patterns emerged. These were then coded and sub-coded and the findings were compared to the results of the literature review. All interviewees were anonymous and given numbers 1-33.

3. Results

3.1. Main themes of the study

From the analysis, themes emerged which were central to the experiences of employees in the Australian offshore oil and gas working environment. A combination of psychosocial factors significantly impacts the safety of offshore facilities. The following themes were revealed in the analysis.

3.1.1. Inadequate accommodation, food and internet

Participants stated that they were generally unhappy with the accommodation provided. To secure any time alone is extremely rare, particularly in living areas like cabins or the gymnasium:

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'*But yeah, this vessel - 2 people to a room and the accommodation's very small, the gym's very small even though it's well stocked and so you can't get any space to yourself, like just a tiny piece is quite hard and that's very challenging and so then off the back of that when you do get that room to yourself which happens so infrequently, but if you get a night to yourself like, you just don't tell anybody and just go back to your room and read a book or you don't have to worry about anybody, that's the hardest part is just how close quarters it is all the time*' (P4).

Food quality was revealed to be an important part of life offshore, significantly affecting the morale of workers (P11, P24, P28, P29):

'*Poor food can also have a big impact on crew morale, when I worked in Myanmar it was near impossible to get veggies and decent meat and they never put out desserts for night crew. Being stuck there for 9 weeks offshore with the same terrible food each day was pretty awful*' (P29).

Food quality appears to have the potential to affect mood and consequently the character of the environment during mealtimes:

'*If you make good food, they talk good conversation while they're sitting eating where they only get together for that one hour. So, I try to keep my food at a high standard, so nobody's sitting there talking about what shit food they're getting, you understand*?' (P24).

Employees' communication quality with family members is frequently poor, particularly during peak period usage, for example when shifts have ended. This was experienced first-hand by the researcher, who lost audio and visual quality frequently during interviews conducted with participants while they were offshore. Loss of connection was a common complaint from participants:

'*It can sometimes be a little bit of a burden because you're obviously not seeing your family every day. It's hard to compensate face-to-face time with phone time. So yeah, it's a challenge…the internet connection or the phone connection that can sometimes impact your mental health*' (P17).

3.1.2. Accidents and mistakes

In particular, the effects of fatigue and long rosters have a significant effect on levels of alertness. In addition, time pressures on tasks become a significant contributing factor in the causation of accidents when production expectations are high. Participant #8 explained the perceived pressure to finish tasks; the perception that they have to get their job done. They are unwilling or do not want to speak up and this is a significant reason for how a large number of accidents are caused. The time pressures that offshore workers perceive is reflected in the concerns about safety shared by P8:

'*They don't realise really, that's secondary to people not getting hurt, but that comes from lump sum contracts. The companies are letting lump sum contracts and the contractors that bid on them as cheap as possible and the faster they go the more money they make*'.

After events such as unplanned shutdowns, workers feel pressure to get production going again (P22). A production-focused organisational or managerial culture leaves employees feeling stressed and unimportant:

'*I've seen managers and supervisors with that old school mentality of, OK, let's go, go, go grind, hustle. Let's get this done as quick as we can. I don't care. But that's my number one and everything else is number two. And you can really tell that that sort of mentality and that sort of message that's being driven is really causing, yeah, that that sense of anxiety, that sense of they don't really have a purpose. They're just a number on a page or a person completing work who's there for two weeks and then they're off and they're not part of that team*' (P26).

Accidents can also be caused by a lack of focus due to personal issues. P13 had witnessed a near-miss accident involving a co-worker who was in the wrong frame of mind:

'*I've seen it, you know, someone wasn't in the right frame of mind one day because we had a morning meeting and two guys luckily didn't get killed, but were close. And all because the guy's head wasn't*

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in in the right spot. He operated a crane and whatnot…yeah. His head wasn't thinking straight and operated the crane in the wrong manner. And the headache block parted from the wire and narrowly missed two people. And you know, just mental health wasn't in the right game, you know, at the time. So yeah, from a cultural perspective there's, you know, make sure that people when they go to do a high-risk task they've got their thinking hat on and you know if people aren't in the right frame we try and, from a work perspective, try and make sure that people are in the right frame of mind when they're doing a high-risk task'.

3.1.3. Fear of speaking up

This is especially true for casual and temporary workers. Raising concerns about safety issues is often avoided due to fear of repercussions such as job loss. Fear of speaking up is generally found more frequently among casual or temporary workers:

'*So that the casual guys, if they do it, they don't get the call back… and the threats from people who have the power to not reemploy people is one of the big issues*' (P13).

The results of the main study reflect the findings of the focus group, where casual workers spoke of their reluctance to express their dissatisfaction with aspects of their work

Fear of speaking up extended to the stigma around men reporting mental health issues:

'*I think people tend to assume that if they are having mental health problems, they may be deemed unfit to work offshore and might lose their jobs*' (P29).

There appears to be different working 'spaces' with the oil and gas industry. Participant #33 explained:

'*From what I've seen and what I've seen that the FPSO like I was saying is the pinnacle of where everyone wants to be, but I've seen the other side of the coin, which is in in drilling, and the bravado and the looking down upon people that have, you know, shown any sort of weakness. It's pretty disgraceful out there*'.

As well as the drilling working environment, the diving community in offshore oil and gas is typically masculine and the effect of workplace culture on whether someone will seek help for poor mental health is 'massive':

'*So, nobody would ever in the diving culture seek that and not make that aware because diving's… number one, you don't want to be mentally week at all, like you would never show* weakness *in diving, ever… I think there would be* (stigma) *for sure because people, especially in diving, you don't want to lose trust in somebody. You know, you are trusting your life because if someone's going to come rescue you, it could be that guy, you know. And it's very much any weakness… do not show any weakness you know? Probably less so above the water, but it's still the same. It's still very much a macho… that classic machismo or whatever it is*' (P4).

Not speaking up in the context of the macho culture of a male dominated workplace extends to reluctance to disclose symptoms of sickness, particularly during the pandemic when symptoms were consistent with COVID-19:

'*I have returned to work after having COVID. And for me, I was generally trying to hide any discomfort or physical symptoms I might have had from the aftereffects of it. So, I didn't really speak up about how I was feeling, if I was tired or fatigued. I was trying I guess not to let my co-workers down and I could know that from that period where we had five guys out with COVID at the same time, after they came back, they all went straight back into sort of a 12-hour day. And I could tell that affected some of them. You know, they went from doing nothing in the cabin for seven days and isolation to sort of full-time work in the sun, you know, lifting heavy things. So, it's definitely a big adjustment for them*' (P10). P16 reported a similar experience:

'*I got flu. I think I got sick because the Air Con was really cold inside. But then you have to be inside and outside during the whole day, so I think that's what made me sick last. Plus, I think someone*

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was sick as well. So, they get sick, but they have to continue working. So, like, if you're working and someone is coughing or sneezing, you still need to be there. I think that's why I got sick. But that's the only time and I didn't have even time like to rest or anything. It was just like take pills, continue working, and yeah, hopefully you'll be better next day' (P16).

'*The self-declaration of someone being fit to work, if they are in insecure employment, some have been reluctant to advise on symptoms as they may not pick up work again for some time. Or alternatively when they do advise they have symptoms they are not paid*' (P13).

3.1.4. Casual and contract workers

A major finding of the study was that casual and contract workers experience higher levels of stress linked to job status:

'*Oh, I also feel the casualization of the whole mining and offshore industry has got a big part to do with it as well because people are scared to speak up about things, like rosters and things. People just want to keep the employers happy, so they've got to do their normal roster and they get that call and it says can you come back two weeks later. As a casual, you're a lot more inclined to say yes, I'll take it, because if you don't take that position, you won't get the call back again'* (P33).

As a casual worker, participant #33 explained that people are unwilling to speak up about injuries:

'*There's also, you know, with people hurting themselves or just other things, you know you're a lot less likely to stand your ground, I suppose, as a casual because you just won't get the call back*'.

Analysis also showed that there was a culture of blame and fear in some organisations, as well as an anxiety around making mistakes. P4, a contractor, reported a lack of accountability, perhaps associated with understaffing and to workers' concerns about losing their jobs. A common process that casual workers are subjected to is one of hiring, firing and rehiring. This avoids organisational duties in the amendments to the Fair Work Act. 2009 (Cth.) which states that employers must offer casual conversion to employees. When the period of offshore work is complete, workers are signed off and paid out, so they are not technically working for the organisation anymore. Likewise, P12 had been refused casual conversion several times, the latest being a few days prior to the interview. P26 confirmed the tendency towards blaming contractors, but that more mature organisations were attempting to change this trend.

3.1.5. Being away from home and work-life interference

Missing out on special events with family and friends was mentioned by several participants (P5 P15 P13 P12 and P21). Being unable to respond to family emergencies happening back home is especially difficult and causes stress to offshore workers (P21, P25):

'*With the sickness side of things, my son suffers from asthma. He had quite a serious asthma attack. He was put in hospital and the company actually put me on a flight and sent me home… which was good because I wasn't, it was probably dangerous to have me at work because I wasn't concentrating*' (P25).

Likewise, P1 felt that inattention to task and lack of awareness caused by issues at home were significant work-related mental health hazards:

'*When an employee has issues at home, this can often preoccupy their mind leading to distraction at work. Particularly during high-risk work (where precision is required), this can have a profound effect on their concentration levels. This lack of attention can result in a significant injury particularly in the process driven environment of the offshore industry where a mistake could lead to a catastrophic outcome*'.

Not all participants experienced help from their company when they had difficulties back home:

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'*Like a bloke I know he had time off because his daughter died and he was bullied and harassed by one of the HR managers to get back to work and you know his daughter died of SIDS… I think by and large, yeah, that they there's a push to try and push people so they quit*' (P13).

'*It's the isolation, you're on an island, a FPSO, a platform, there's no social aspect of life, you are isolated from your family. Worse times are birthdays, Christmas, if someone is in an accident, my son was in an accident and they wouldn't fly me off, but I used to do that, so I know how easy it is to fly people off*' (P21).

Another worker with obvious mental health difficulties was not given the necessary help:

'*There was another guy, he had some mental health things going on. He went to work on a ship and when he got home, he stabbed another person. They died. Yeah. So, like he immediately had some mental health things going on, but he was pushed and then he had to get off the ship. And then when he got home, he killed his housemate*' (P13).

'*...the boys noticed that he wasn't right. And they phoned the office at the time, and they said you need to get him off, you need to get him off. He's not right. And they said no, no, he said he's OK. So yeah, he's staying. And this guy stayed, went through work and he wasn't right at work, when he got off work, he went home and killed his flat mate*' (P24).

Other issues at home such as unresolved interpersonal issues (P1, P8, P13) that do not generally warrant an employee being flown off the facility are worsened by isolation (P15). P8 cited high rates of divorce in their department. Isolation on an offshore facility or vessel tends to worsen family issues, especially if the ability to communicate properly with family, particularly children (P15), is disrupted by poor internet provision (P2, P3, P4, P6, P7, P10, P11, P17, P18). Transitioning back into home life after being offshore for weeks is difficult (P8) and workers feel that they live two separate lives (P28).

3.1.6. Micromanaging

Participants expressed frustration at the tendency for managers to micromanage workers, a damaging practice which reveals a lack of trust in workers (P28). Again, raising safety concerns showed a tendency to cause difficulties for workers:

'*I'm in quite a strong trade union, which I'm proud to be. But having said that, that doesn't mean we're, you know, rebellious, but we do the things, but we won't accept anything less on safety or conditions of work and these guys have come in with a pretty intimidatory style, so yeah we were definitely singled out. But you know, you had to watch your back at work in regards to what you did on jobs they, you know, they check up on you, send people out to make, you know, try and catch us out on safety to try and undermine us being on board*' (P6).

One organisation excessively controlled food portions. P20, qualified cook, stated:

'*We're all qualified to do our jobs. And the micromanagement is getting out of control in my opinion and not just in my department but in other departments too yeah, they get around it. We all get around it one way or another. But it just makes it stressful. We just wanna go there and do our jobs, you know, and do them safely. Obviously, safety is a big issue. But to micromanage everybody's diets I think is beyond… that's getting to become a control freak I think really*' (P20).

However, the over regulation of food options may have had more to do with cost:

'*So, they really cut down on the budget and they end up, you know, serving sausages and mashed potatoes and stuff like that. So, it's just not a good thing to do, but the effect that it has on, you know, crew morale is, is huge. It's huge, but for whatever reason, companies, you know, we had a KPI. They audit every cent that's spent and you're only allowed a certain amount per head*' (P8).

Several participants had worked under managers who were overbearing, with strong egos (P6, P29) and with '*an intimidatory management style*' (P6). Unfriendly or unsupportive managers cause their workforce to be unhappy and to dread returning to work (P29).

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'*There was a manager that used to work at our company who has now been let go because of the way he treated people, and everyone that worked with him used to say how much they dreaded going back to work. A previous manager I worked for offshore was extremely demanding and constantly paging me to get updates on what was happening and there was little trust in me, I found this quite mentally taxing and would feel so much more exhausted working under him than his back-to-back*' (P29).

Antithetical to micromanaging is allowing employees role autonomy:

'*I think that one plays a big part in affecting mental health. When you go into a job and you know that you've got that autonomy and you've got the trust of your managers and supervisors. It does incentivise you to do better and achieve*' (P27).

3.1.7. Bullying from higher up

Bullying was reported in the sample, but it generally came from management level employees:

'*It's generally from higher up because there's always a little bit of banter amongst the team, but generally speaking, I've always found that to be restrained and healthy, you know*' (P22).

Bullying shows similarities with micromanaging in that they both tend to originate from higher up the organisational hierarchy. P21 had experienced exclusion from meetings and trips, demotion and barriers to promotion. P8 advised:

'*The only thing that you can do, and, you know, people do do this, they would just start taking notes and with bullies all you have to do is confront them, and you know when you get some evidence behind you and then one day, just confront them and just say this is the last time, like no more because it's always a strong, big strong alpha male picking on the weakest one in the group*' (P8).

3.1.8. Gendered harassment

A female participant in the focus group did not indicate gendered harassment. P16 stated that workplace culture and the protracted time spent offshore in an unfavourable environment was potentially able to affect workers. However, the respondent did not refer to what made the environment unfavourable. One potential female participant chose not to go ahead with the study due to fear of being identified. The experiences of sexual harassment for this individual were specific enough to potentially identify them to their colleagues. P20 and P29 were both impacted negatively from the male-dominated environment offshore. P20 explained an incident that had happened on a vessel they worked on:

'*The incident itself didn't cause me the stress, the stress came afterwards, which I predicted. When other crew members took an opinion about it and most of them that weren't there. So it was like, yeah, it was one of those female things, female-male things that went on anyway. But it was witnessed by three males who stood up for me, but some males think that you're being woke or whatever it is that they've got in their head and they then bully you afterwards and make you feel like you were lying or something like that*'.

P29 described their experience of harassment while working offshore:

'*I experienced a bit of harassment from one guy who was interested in me when I made it very clear I wasn't interested*'.

3.1.9. COVID-19 impacts

Extended periods away from the family during the COVID-19 pandemic were stressful (P14. P16. P29). Along with extended separation, there were major concerns for loss of work (P4, P7, P24), particularly during economic downturns:

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> '*There's a lot of guys, mariners, that just can't keep up their tickets and things like that and just, you know, just basically get squeezed out of the industry and that's what's happened now. And now everyone is looking for people in WA and you know, a lot of good guys are gone and they can't get back into the industry because they just don't have the money to get their tickets again, like it costs so much for a casual employee on vessels to get all your tickets back again, you know you need a 15 grand kicker straight up there to get into it and you can't get a bank loan because you don't have the money or security so you're kind of stuck. We've lost a lot of good people*' (P33).

Other concerning factors include loss of leave (P24), coercion to move interstate to circumnavigate state quarantine mandate (P4, P8, P13). During the height of the pandemic, offshore workers experienced increased fatigue and mental health issues:

> '*We have seen a marked rise in mental health issues, and staff having to demobilise early due to fatigue and mental health. COVID-19 has certainly been one of the root causes of this worrying trend. We have seen a direct link between fatigue and mental health*' (P1).

The procedures put in place by organisations in response to the pandemic were criticised by P22:

> '*Definitely cause that's why I resigned from a full-time position. You know I'd been there 14-15 years whatever it was. And then I just got sick and tired of being locked up. Told what you're gonna do. Told what you're allowed to eat. Told what you're allowed to drink. The whole way it was managed, if you could call it that, I found very frustrating. And they even, even when the pandemic first broke and we actually raised it with onshore management saying, listen, because we were sailing for Singapore, said have you got anything in place or have you thought about anything around what's going to happen with this? And they laughed at us and said we're watching too much social media. And then we set off for a three-week journey and three months later we got back home and that was after being anchored up there and there was no certainty about how they could get us off or when they could get us off. They wouldn't send food out to the ship because they're worried that we're gonna run out or we're gonna get COVID off the packaging on the food*' (P22).

3.1.10. Heat stress

High humidity is common between March-May in the southern hemisphere tropics when workers use several pairs of overalls each day (P18). Several participants referred to the heat as a major factor in discomfort (P1, P6, P7, P8, P9, P13, P16, P18, P23, P25, P26, P28). The relentless heat is often unbearable:

> '*No, just the heat, the oppressive heat. You got heat coming off the equipment. The engine room like it's just hot, hot, hot. We'll do our first three hours, you know, we'll go outside at 7:00 o'clock in the morning and when we come in for smoko at nine, we just have to drop our overalls on the ground and put a fresh set of overalls on. So, we'll do a set of overalls every three hours. You can't come back inside into the air conditioning and with absolutely sweat sodden overalls. Yeah, you just get the chills*' (P8).

Although heat stressors are managed extremely well in the offshore working environment, failure to keep hydrated or recognise the sign of dehydration can be devastating:

> '*One of my colleagues, he did get heat stress and ended up in hospital. And unfortunately for that person, he did have some slight brain damage as well… As far as I know, no, he won't be working again, to be honest*' (P28).

4. Discussion

Sex and Gender Statement

The Western Australian offshore oil and gas industry is a male dominated industry, and an analysis of results was not conducted to determine any differences between male and female

participants responses. A reason for not conducting a gender analysis was because the research only included 4 female participants, with the rest of the participants being male.

Company-provided facilities such as accommodation, food and internet were mentioned frequently by participants. Poor accommodation has wide-ranging negative effects such as reduced quality of sleep and resulting fatigue [12] and inability to disengage from work [13]. Fatigue is linked to decreased motivation, communication, attention and recall and reduces an individual's ability to make decisions. Furthermore, there is an increase in the tendency to make errors [14] and perform at a reduced level [15]. Good quality food and sleep are considered to be one of the most important factors in work programs [16]. Providing permanent alone accommodation would significantly help to improve mental health and wellbeing [2] as sometimes the room that workers slept in was changed frequently during their time offshore.

As P13 witnessed, near-miss accidents are highly likely when workers are distracted or not in the right frame of mind. Distracted employees are at a higher risk of being involved in accidents because their ability to identify hazards is reduced [17]. Furthermore, when the focus is on production, particularly after a shutdown [P22], there is a diversion of cognitive resources to concentrate on meeting production targets [17]. When cognitive resources are stretched, concentration and alertness are reduced, and any peripheral safety cues may be missed [18].

Communication between team members is vital for a collaborative work environment. However, speaking up about workplace issues can impact negatively on interpersonal communication and connectivity. Casual workers are likely to have less information available to them due to the weaker flow of information, perhaps due to the association between insecure work and work disorganization [19]. Power discrepancies between managers and workers further impair employees' sense of control over work tasks, promotion, and future career options. Being excluded from meetings and trips means that information sharing is further compromised and consequently can undermine work performance that could be a challenge to reverse [20]. Speaking up has been referred to as '*booking a window seat on the next flight out of here*' [21] (p. 16). Several of the interview respondents alluded to the organisational focal point of being in a state of production (P22, P26 P29), notably on drilling sites (P6). In times of high production, employees would be expected to work overtime (P29).

A major finding of the study was that casual and contract workers experience higher levels of stress linked to their job status. Casual conversion is available to employees who have worked a steady pattern of shifts for 6 months and to have been with the same employer for over 12 months [22,23]. Unfortunately, 40.9% of casual employees in Australia are disqualified from casual conversion on these criteria [24] and the organisation may still refuse conversion based on 'reasonable grounds' [23]. The process of hiring employees for their short-term duration offshore and then terminating their contract and restarting it again for the next offshore swing should not be used as a tactic by organisations to avoid casual conversion, or to deprive workers of opportunities to vote on employment matters (P20).

Research on offshore facilities has noted that casual or contract workers have experienced inferior conditions. On North Sea facilities, it was found that contractors generally performed the riskiest work and reported an 'us and them' culture [25] (p.588). Permanent employees are less willing to trust temporary employees because of their short-term status [26]. Trust between workplace teams may safeguard against the emergence or progression of blame culture within an organisation [27]. Because open communication and the flow of information facilitates safety behaviour, organisations should seek to build on the manager-employee trust relationship. Giving employees role autonomy will strengthen this relationship, which is crucial if there is to be accountability without blame. Like micromanaging, low role autonomy can lead to feelings of helplessness [28], to poor performance [27] and eventually to interpersonal conflict [27,28].

Spending prolonged periods away from home and family on a regular basis means that usual support avenues for workers are unavailable. Where there is conflict between family and work, stress can manifest [7,29–31] to affect attention levels during tasks and safety compliance [32]. Living away from home is a major drawback of working offshore [16] and often there is a resulting difficulty in

balancing work and family responsibilities (13,33] and in readapting to family life [P8,33]. Reintegrating back into the family home is made more difficult by fatigue [2] and by misaligned expectations from both partners (P8).

Micromanaging is associated with low workplace morale, reduced productivity and high levels of employee turnover [34,35]. Supervisors who micromanage their workers suppress creativity [35], underestimating the potential for development and growth within the workplace and the organisation as a whole. Furthermore, it places employees at risk of burnout and is a common reason for workers leaving their job [34].

The results consistently showed that the source of bullying came from sources where unequal power relations existed, such as management and other workers. While P20 and P29 experienced gender harassment, other participants had experienced bullying from management level, a similar finding to other research [2], where results showed that 40.54% of participants identified bullying as coming from supervisors or management. Over half of the employees in another study [36] had experienced bullying in the workplace, with close to one third (32.3%) reporting moderate to severe depression. Both of these studies examined Australian onshore mine workers. Being a victim of bullying affects employees' intentions to remain with the organisation [37]. Other research reported a four-fold increase in psychological distress. Supportive practices opposing bullying to tackle the patterns of masculine norms present in the mining environment are suggested [2], lending weight to the theory that social support is negatively associated with bullying [39].

In a study involving female FIFO workers [40], all participants often felt discriminated against by male supervisors. Furthermore, career progression was difficult due to the barriers to networking opportunities for women. Female oil and gas workers endure an environment of pervasive sexual harassment [41] and two of the four female participants in this study indicated that they were negatively impacted by the male-dominated work environment. Impacts of gendered organisational climate are often experienced as discrimination, harassment and sex-role stereotyping.

When rosters were extended during COVID-19, additional strains were placed upon a population that are already vulnerable to poor mental health and have a higher risk of suicide [2,42]. Rosters for offshore workers are generally lengthier than those for onshore workers, with the shortest roster offshore being two weeks (P29). The longest roster was six weeks away (P11) while during the pandemic this extended to 3 months away from home for some workers (P22).

The main concerns for participants were catching and transmitting the virus (P1), echoing other recent study findings on offshore workers [43] and through a national survey during the first month of COVID-19 restrictions [44]. In particular, the fear of infecting loved ones or family members caused distress [P1,45] and there had been frustration and nervousness about when the pandemic would end. Research has found poor mental health due to characteristic FIFO stressors together with quarantine measures and fear of job loss [46]. Another common cause of stress was attempting to hide symptoms similar to those of COVID-19, causing presenteeism which impacts productivity and heightens errors and accident risk, increasing the likelihood that employees will become absent in the future with worsening physical and mental health [47]. Many participants traveled interstate to work offshore and were often kept away from family for months at a time, causing understandable distress, echoing these results [46]. Confinement and restrictions were significant issues for P20 and P22, which mirrors other author's findings [48] of frustration at being confined and restricted from contact with others.

In the tropical north-west of Australia, daytime temperatures can reach extreme highs. Further climate-specific events include cyclones [49] and humidity [50]. Other situations affected by heat are motion sickness, hazardous ocean conditions [52] and helicopter travel [7,53–55]. Although clothing can function as a protective factor against radiant heat, it also acts as a barrier to the human-environment exchange (56]. Carrying out the most physically demanding tasks between 10-2pm in the shade (P13) and staying hydrated are practices already in place in some organisations. Colleagues offshore generally look out for each other (P28) and would rather co-workers have a refreshment break than develop heat stress (P22). Fortunately, breaks are well-managed (P9,P18) and there is a stop work option if it becomes too hot (P13).

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Not only can abrupt changes to the weather increase the risk of accidents, but it can also place demands on employees' personal resources. Anticipating the arrival of bad weather may cause psychological stress in the form of perceived time pressure, creating a tense and anxious working environment [13]. Because production and cost pressures are sometimes prioritised, concerns regarding potential accidents increase. Moreover, fatigue can result in a decline in attention, particularly where there are shift rotations. A lack of trust between team members and supervisors is linked to poor interpersonal behaviours and poor communication about safety, decreasing the chance that existing organisational flaws, which may contribute towards accidents, can be identified.

5. Conclusions

The main findings of the study can be summed up in the themes identified. There were several sources of stress from company-provided facilities. When considering that the possibility of accidents and mistakes are a stressor, the resulting fatigue from poor facilities is even more important to consider. Being away from home compounds the effects of a stressful environment. Casualisation has had major negative effects on the offshore workforce and the subsequent insecurity contributes to poor mental health. This was worsened by the COVID-19 pandemic when the general trend in employment security took a downturn. This also intensified the reluctance to speak up on work and safety issues due to fear of job loss, blacklisting and discrediting. When speaking out about issues, employees run the risk of bullying and harassment from those whom they are in an unequal power relationship with. Raising safety issues appears to be an unwelcome practice in some workplaces when this should be encouraged in a mature organisation.

Prior to the pandemic, research into FIFO workers' mental health and wellbeing had been identifying declining mental health and increasing suicides. This research has revealed significant sources of psychological distress for a seldom researched population, in particular the female offshore oil and gas workforce.

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Appendix A

Focus Group Interview questions

Positioning statement: The offshore oil and gas working environment is unique and may hold many psychological stressors for employees. When considered together, these factors may pose a greater than average risk to employees' mental health and wellbeing. This discussion aims to facilitate the development of effective interview questions for the research participants of the study *Identifying Western Australian Offshore Oil and Gas Workers Mental Health Hazards and Risk Control Measures*.

Exploratory Questions:

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In your experience are there any management practices or work organization practices that affect mining industry employees' mental health? If so please explain.

Do you know of any psychosocial obstacles for employees when returning to work following a work-related injury or ill health and if so how do you think that these can these be mitigated?

What do you think are the main types of, and causes of, mental health stressors for offshore oil and gas workers? What risk control measures do employers use for these mental health stressors and how effective do you think they are?

If employees have poor mental health, how does this impact on offshore employees' health and their safety?

Do you know of any economic effects on organizations when employees have to deal with psychosocial issues and/or poor mental health? If so, what are the economic effects?

What do you think are the economic effects of having good employee mental health practices implemented by the company?

Regarding best practice, what do you find gives the best outcomes for promoting positive mental health for employees in the workplace?

Where do you think that there are opportunities for improvement in promoting positive mental health practices for contractors and workers with ongoing employment in the offshore oil and gas industry?

Exit statement:

Is there anything else that you would like to add to the discussion, or anything that you feel was missed?

Appendix B

Main Study Questions

Positioning statement: It has been identified that the offshore oil and gas working environment can be stressful for workers, particularly when considering mental health and wellbeing so it is necessary to investigate the psychosocial stressors which present themselves to employees in this environment and examine the personal, organisational and economic implications of poor mental health caused by these stressors. A work-related mental health hazard is defined as work demands that do not match the workers to their knowledge and abilities or the resources that they have available to do the work. The response can be cognitive, physical, behavioural or emotional. Work related mental health hazards include, but are not limited to, physically and/or cognitively demanding work, aggression, bullying, interpersonal conflict, under-supervision, over-supervision, lack of constructive feedback, lack of support, lack of respect, work overload, lack of role clarity, poor organisational change management, unplanned work events (e.g., over-time, call-outs), awkward roster design (e.g. mid-swing rotations, working night shifts after traveling during the day), extreme weather conditions, suboptimal living and sleeping conditions (e.g. vibration, restricted living area, high levels of ambient noise, lack of privacy), poor organisational justice, fatigue, burnout, experiencing dangerous occurrences, exposure to trauma, and emergency management. Further, being physically or socially isolated from friends and family may be an additional burden (NOPSEMA, 2021a; DMIRS, 2021; ISO, 2021).

The aim of this interview is to identify mental health hazards and possible solutions to these stressors and inform organisations and policy makers of best practices for preventing, identifying and improving poor mental health in the offshore working environment.

Demographic information

What is your role in the oil and gas industry?
Do you work for a large (more than 200 employees) or small company (less than 200 employees)?
What best defines your work status? You may agree to more than one.
Permanent
Contractor

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Part of a service company
Casual
Length of experience in the offshore oil and gas industry?
Less than 5 years
6-10 years
11-15 years
16-20 years
21-25 years
26-30 years
30+ years
Which age group do you belong to?
Under 25
26-30
31-35
36-40
41-45
46-50
51-55
56-60
60+

Exploratory questions

What are your rostered hours of work and for how many days/ weeks at a time are you at a time rostered to work offshore?
How do you feel about this?
Have you experienced any management or work organisation factors that have caused you stress? If yes, please explain how this affected your mental health.
Have you had any time off work due to stress?
Are there any environmental factors that have affected your mental health when working offshore? If yes, please explain.
What do you perceive to be the main work-related mental health hazards?
Have you experienced any psychosocial stressors? If yes, please explain.
If you have experienced returning to work after an illness or injury, how were your mental health needs considered in your return-to-work plan?
How does the workplace culture affect whether someone will seek help for stress or poor mental health?
In what way have you found that the personality of managers affects employee mental health?
In what way have you found that the personality of co-workers affects employee mental health?
Does stigma seem to affect poor mental health help-seeking and reporting?
Have you ever had a psychological illness or suffered from poor mental health?
If 'Yes':
Has having a psychological illness or poor mental health had an effect on you financially?
Have there been any economic effects on your employer or its employees from a worker being stressed or from having poor mental health? If yes, describe the effects.
Does your employer provide mental health education? If yes, please describe the education provided.
Does your employer implement any other strategies for mental health promotion or support? If yes, please describe these strategies.
What interventions or approaches does the company have to develop employee resilience? Resilience is the capacity of a person to recover quickly from difficult situations through having good problem-solving skills that enable the person to cope when there are difficulties.
In your experience, what have you found most beneficial for improving employee mental health?
Has the COVID-19 pandemic had any effect on your mental health? If so why?

Exit statement:

Is there anything else that you would like to tell me about psychosocial stressors or mental health hazards, what is done well to manage these hazards and if there are opportunities for improvement in managing employee mental health in the offshore oil and gas industry?

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