

No ordinary call: factors predicting fire communication officers' job strain and well-being

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ABSTRACT

Based on the Job Demands-Resource model (JD-R), the present study investigated the contributions of job demands and job resources to the mental health of emergency service workers. Eighty-one fire communication (FireCom) officers employed by Queensland Fire and Emergency Service, (52 females, 29 males; aged between 21 years and 55 years+) completed an online self-report questionnaire that assessed the contributions of job demands (including acute demands, chronic demands, and demands of shift work), age, and job resources (including social support and self-efficacy), as predictors of four indices of mental health (well-being, depression, anxiety, and stress). Four hierarchical multiple regression analyses were conducted. Higher social support, in particular family support, was found to significantly and positively predict well-being and negatively predict both depression and stress. The association between self-efficacy and overall well-being was not significant. Individuals with higher chronic job demands had higher levels of stress and anxiety but not depression, while those with higher acute job demands reported high levels of depression only. These findings have implications for the way FireCom officers can be best supported and educated to achieve positive mental health outcomes and continue to successfully provide that first link between the community and emergency services.

INTRODUCTION

The Queensland Fire and Emergency Service (QFES) is the primary provider of fire and rescue, emergency management and disaster mitigation activities in Queensland. The service includes Fire and Rescue, Emergency Management Queensland, Rural Fire Service (Queensland) (RFSQ), and the State Emergency Service (SES). This makes the QFES Fire Communication (FireCom) officers the vital first link between the Queensland community and fire and emergency incidents. When a triple Zero (000) call is made, it is re-routed from Telstra to the required emergency service (Ambulance, Fire or Police) and then to the communication centre nearest to the incident. It is the responsibility of the Fire Communication officer (FireCom) to gather information; co-ordinate and manage resources; dispatch an appropriate response; and maintain an accurate log of all communications. The roles performed by FireCom officers have expanded in recent times to include deployments to disasters such as extreme weather and wild fire incidents both within the state and interstate. While phone contact eliminates direct physical danger, there is still the need to judge situations based on ambiguous information, provide psychological support, and handle difficulties in communication (Dunford, 2002). Although, Fire Com officers are not exposed directly to trauma, they can experience secondary or vicarious trauma by listening to the primary victims' experiences (Figley, 1995) or by assisting people in highly stressful situations and traumatic events experienced by others (Miller, 1995).

FireCom officers are required to work under pressure in stressful situations and must have the ability to prioritise heavy workloads and multitask in a time-critical environment (QFES, 2016). These unique work stressors coupled with the problems associated with shift work (Petru, Wittmann, Nowak, Birkholz, & Angerer, 2005) all increase the job demands faced by FireCom officers. High job demands, such as high workload, emotional demands, and problems with work equipment or changes in the task have been identified in past research to be important predictors of health problems (Bakker, Demerouti, & Schaufeli, 2003).

However, as detailed in Shakespeare-Finch (2015), despite being regularly exposed to organisational and operational stressors and potentially traumatising events, there has been little research on the well-being of FireCom officers. The current study aimed to fill this gap. The study investigated both negative (job demands, shift work) and positive (self-efficacy, social support) as predictors of FireCom officers' well-being, depression, anxiety, and stress based on the Job Demands-Resources (JD-R) model (Bakker & Demerouti, 2007; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). As such, the study helps gain a broader picture of the factors affecting the general population of emergency services personnel. Investigating the influence of self-efficacy and social support is useful as, unlike other work context variables, these factors can be changed and adapted with consequent benefits for worker well-being (LeBlanc, Regehr, Birze, King, Scott, & MacDonald, 2011). Thus, by investigating both positive and negative predictors, the study may contribute to the amelioration of mental health problems in the emergency services workforce.

BACKGROUND

The background is organised as follows. First, the dependent variables (well-being, depression, anxiety and stress) in this study are defined. Second, background is given on the job demands-resources (JD-R) model (Bakker & Demerouti, 2007; Demerouti et al, 2001). It then discusses job demands, including the demands associated with QFES Greater alarm response system (GARS) and perceived work demands (PWD). The influence of shift work and age as predictors of health and well-being is also examined. Potential benefits of job resources such as self-efficacy and different levels of social support are also discussed. The background concludes with a justification for this study and presentation of relevant hypotheses. Figure 1 provides an overview of the study variables.

WELLBEING

The nature of emergency services work means Firecom officers are likely to be regularly exposed to potentially traumatic events, which may or may not impact their mental health and well-being. Like other workers, they may also experience common workplace stressors, such as excessive workloads, insufficient support and workplace bullying or discrimination (Tennant, Hiller, Fishwick, Platt, Joseph, Weich, & Stewart-Brown, 2007). The current study examined the relationships between job factors such as these and workers mental well-being, where mental well-being is understood to relate to a person's psychological functioning, life-satisfaction and ability to develop and maintain mutually benefiting relationships (Deci & Ryan, 2008). Well-being includes both short and long term mental functioning and incorporates both positive and negative health (e.g. anxiety, depression and fatigue; Brough, 2005). Therefore, the current study included measurement of depression, anxiety and stress so as to provide a reasonably comprehensive evaluation of psychological well-being.

DEPRESSION, ANXIETY AND STRESS

Several studies have shown the negative consequences of depression, anxiety and stress in the workplace (Cavanaugh, Boswell, Roehling & Boudreau, 2000; Greenberg, 1999), in particular, emergency service personnel, such as police (Husain, 2014), professional firefighters (Heinrichs, Wagner, Schoch, Soravia, Hellhammer, & Ehlert, 2005), and in other aspects of life, including social interactions (Alden & Phillips, 1990; Davies et al., 1995). Negative emotions such as depression or anxiety may also be experienced by some individuals following exposure to trauma (Grant et al., 2008). Broadbent (1985) found particular features of jobs are associated with different types of strain indices. He concluded that job demands (work load and pacing) primarily affect anxiety, and social isolation (lack of social support) primarily affects depression, that satisfaction and anxiety have different correlates, and that depression correlates with factors that have no effect on anxiety. Given this, the current study investigates whether different job demands and resources predict different mental health indices.

THEORETICAL FRAMEWORK

The job demands-resources (JD-R) model (Bakker & Demerouti, 2007; Demerouti et al, 2001) proposes that every occupation may have its own causes of employee well-being that can be organised into two broad categories, job demands and job resources. High job demands, such as emotional demands and work pressure exhaust employee's mental health and physical resources. Job resources are aspects of the job that reduce job demands, stimulate personal growth or are functional in achieving work goals (Bakker et al., 2005). Good examples of job resources that have the potential to buffer job demands are performance feedback and social support (Haines, Hurlbert, & Zimmer, 1991). The JD-R model assumes that job strain and burnout develop when job demands are high and when job resources are limited.

JOB DEMANDS

Firecom officers are faced with unique communication demands, including the need to make decisions and dispatch resources based on ambiguous information, provide advice and reassurance to the Queensland public, and communicate with other stakeholders from a wide range of different organisations. Forslund, Kihlgren, and Kihlgren (2004) found that the emergency dispatch role was stressful, as decisions need to be made quickly and assessing information over the phone is difficult. The unpredictable nature of most incidents and situations where poor or ambiguous information was provided adds to operator stress.

Job demands have been identified as one of the most common sources of work-related stress and can be characterised in a variety of different ways. One means of conceptualising job demands is in terms of the frequency with which workers are required to respond to critical or extreme events. The most commonly researched job demands are considered chronic, as they are thought of as constant for an employee (Beehr, Jex, Stacy & Murray, 2000). However, there have also been studies of short-term job demands or acute job demands involving emergency personnel such as police officers (Caplan & Jones, 1975), and ambulance personnel (Van der Ploeg, 2003). Previous research has shown that acute and chronic stressors, may differ in the impact they have on worker stress and performance (Beehr & Franz, 1987). Several studies (Bennett, Williams, Page, Hood, Woollard & Vetter, 2005; Halpern, Maunder, Schwartz, & Gurevich, 2011) have attributed the development of depression and anxiety to either acute or chronic stressors. Therefore, for the purpose of the current study job demands were conceptualised and measured in terms of both Greater alarm response system (GARS; acute job demands) and perceived work demands (PWD; chronic job demands).

GARS – ACUTE JOB DEMANDS

The level of response to an emergency incident in the QFES is termed the Greater Alarm Response System (GARS). The GARS is structured to facilitate resources for emergency incidents and allows provision of an automated response with specialised support to the officer in charge. A significant part of GARS is the alarm response level. As the size or the complexity of the incident increases there is a corresponding increase in the alarm level (QFES, 2016). The officer in charge of an incident will request a certain alarm level that

will provide a certain level of core firefighting resources, specialist support resources and command officer. A higher level of alarm and response places a higher level of job demand (and potentially higher level of stress) on FireCom officers.

Appendix 1 gives details of the number of fire trucks and other resources responded with each level of GARS or alarm level. A first alarm response usually involves one fire truck and limited other resources, as well as low-level job demands on FireCom officers, whereas a second alarm requires significantly more resources and places significantly more job demands and emotional stress on FireCom officers. Van der Ploeg & Kleber (2003) found employees working in medium or high-risk professions, such as firefighters and emergency workers, are often confronted with acute stressors or critical incidents in the workplace that reduce well-being and increase workplace stress, depression and anxiety. In the current study, the GARS was used as a measure of worker exposure to acute stress.

PWD – CHRONIC JOB DEMANDS

Perceived work demands (PWD) is a perception regarding demand levels within the work place (Boyar, Carr, Mosley & Carson, 2007). A number of studies (Michie & Williams, 2003; Roelen, Schreuder, Koopmans & Groothof, 2008) have shown associations between long working hours, high job demands, and psychological strain. There are indications that perceived workload is more important in determining health than the actual workload (Hobson & Beach, 2000). Therefore the current study also measured what FireCom operators perceive as their regular, daily or chronic experience of job demands in the workplace.

Specific job demands have been repeatedly found to predict exhaustion (feelings of severe fatigue) among various occupational groups (Bakker, Demerouti, & Schaufeli, 2003). Given that exhaustion has been recognised as a main indicator of negative strain (Karasek, 1979), and that shift work may contribute to worker exhaustion, the present study investigated the effects of shift work on overall FireCom officer's positive and negative well-being.

JOB DEMANDS – SHIFT WORK

Sleep is essential for normal life and very important for overall health and well-being. Shift work is defined as “a system of employment where an individual's normal hours of work are, in part, outside the period of normal day working and may follow a different pattern in consecutive periods of weeks” (Collins English Dictionary, 2009, p.p. 420). Research has shown documented that working shift work can have a negative impact on a person's daily health habits (Clendon & Walker, 2013) and night shift work in particular presents significant problems with regard to well-being, health, and occupational safety (Harma, 1998).

FireCom officers' are required to do shift work, which has been identified as a potential negative influence on well-being and health (Costa, 1996). Night shift in the QFES is between 6pm to 8am with permanent FireCom officers work a rotating four days on, four days off “10/14 roster” (2 x 10 hour days followed by 2 x 14 hour nights, then four days off). As well as the reduction in the quality and amount of sleep, shift work may cause

difficulties maintaining usual relationships both with family and outside social ties (Costa, 1996) and maintaining a healthy work-life balance (Camerino, Sandri, Sartori, Conway, Campanini & Costa, 2010). Shift work in general, but especially night shift work, presents a significant problem with regard to well-being, health, and occupational safety (Harma, 1998).

The JD-R model proposes that job demands such as shift work are predictive of feelings of exhaustion and contribute to physical and social aspects of a job that require effort and may have physical and mental costs (Bakker, Demerouti, & Euwema, 2005). Almondes & Araújo (2009) found working shift-work caused higher levels of situational and dispositional anxiety, when compared to fixed daytime work. Another study found 10% of Melbourne paramedics working the same four on, four rosters as the fulltime QFES FireCom officers, were suffering from severe or extremely severe depression, and above normal levels of anxiety. Nearly 40% reported higher than normal levels of stress (Courtney, Francis, & Paxton, 2010). Given this evidence, the higher the average of number of night shift hours FireCom officers reported over a two-week period, was expected to be predictive of higher levels of psychological strain in the current study.

AGE

Ageing may also be a factor increasing the adverse effects of shiftwork on well-being and health. As age is associated with increase vulnerability to several influences that effect overall well-being (Harma, 1998) such as poorer sleep quality, less healthy lifestyles, fatigue and cognitive impairment (Clendon & Walker, 2013), it was also investigated in the present study. Findings from previous studies on the effects of age have been shown inconsistent, with age bringing experience and increased ability to cope but also showing a decrease in well-being and ability to cope (Foret, Bensimon, Benoit, & Vieux, 1981). Research suggests that older people may be less able to adjust to abrupt changes in sleep timing occasioned by shift work (Harma, Hakola, Kerstedt, & Laitinen 1994), although other studies have failed to confirm this (e.g., Monk, 2005). Adaptation to shift work depends partly on circadian type and on changes in daily rhythm (Griefahn, Kunemund, Golka, Thier, & Degen. 2002; Roenneberg & Merrow, 2003). Age is an important factor, since the circadian rhythm of people older than 40 years seems to be less adaptable (Reid & Dawson 2001). Gershon, Lin & Li (2002) study investigated the well-being of aging emergency service personnel (police) doing shiftwork. A key finding of this study is that older officers with higher levels of work stress are at significant risk of serious physical, mental, and health risk problems. In this study, three of four officers reporting stress also reported symptoms of depression and perceived work demands was significantly associated with anxiety.

Looking at job demands is not enough when it comes to the well-being and health of FireCom officers. The presence of resources is also important, as they will help employees to handle their job and life stressors. Therefore, the present study investigated the positive influences of resources two job resources on well-being.

JOB RESOURCES – SOCIAL SUPPORT

Social support is defined, alternatively, as having friends and other people, including family, to turn to in times of need or crisis so as to provide a broader focus and positive self-image (Salovey, Rothman, Detweiler, & Steward, 2000), or as information from others that one is loved and cared for (Cobb, 1976). Social support enhances quality of life and provides a buffer against adverse life events. Warner, Gutierrez, Villegas & Schwarner (2015) found receiving social support shortly after a traumatic event was an important coping resource and was in turn associated with more adaptive adjustments. Social support has been significantly and positively linked to well-being and according to Cohen and Willis (1985), it protects against the adverse impacts of stress. Studies with emergency medical dispatch operators found that receiving social support from others helps protect against the harmful effect of job stress (Cohen & Willis, 1985) and is related to lower levels of posttraumatic stress disorder (PTSD) in other emergency services (Stephens, Long, & Miller, 1997). Therefore, it was predicted that social support will have a direct positive effect on well-being and negatively predict depression, anxiety and stress.

Previous investigations of workplace social support have focused on evaluating the impact of support received from various sources, typically supervisors and colleagues (Brough & Frame 2004; Pears 2004; Dollard & Winefield, 1995). Supervisor social support, in particular, has been identified as alleviating the negative consequences of occupational stress across a variety of job contexts (Bliese & Castro, 2000). In contrast studies involving emergency service workers found that fire fighters in particular favoured partner and work support over supervisor support (Haslam & Mallon, 2003). Therefore, it is predicted that social support will have a direct positive effect on well-being and negatively predict depression, anxiety and stress.

JOB RESOURCES – SELF EFFICACY

As mentioned previously, job resources are those aspects of a work place that help with employees' achievement of work goals, reduce demands, and stimulate growth and development, and lead to organisational commitment (Bakker, Demerouti, & Euwema, 2005). One such job resource is self-efficacy, which, Bandura (1997) defined, as the level of confidence a person has to perform a specific task. It is the feeling of confidence (or lack thereof) about accomplishing job related goals and succeeding with a challenging project at work. More specifically, self-efficacy relates to our confidence in our own ability and in the likelihood of being able to succeed in a challenging work situation (Bandura, 1997; Paulhaus, 1983).

Bandura's social cognitive theory proposes that a reaction to stress depends on levels of self-efficacy. High self-efficacy predicts better adjustment to the environment, with lower levels of strain and burnout across various professions (Bandura, 2000). Self-efficacious employees are protected from burning out not only because they cope better with the negative emotions generated by the work itself, but also because they adjust to the work environment, and interact differently with it (Consiglio, Borgogni, Alessandri, & Schaufeli 2013). Therefore, it is predicted that FireCom operators who believe they are capable of handling job tasks effectively will experience greater well-being and lower job strain.

THE CURRENT STUDY

Despite the important role of QFES FireCom officers, there has been little research on their overall mental health. Therefore, the current study aimed to investigate the mental health of FireCom officers by utilising the JD-R theory. The study measured both positive (self-efficacy and social support) and negative (job demands and shiftwork) predictors of employee well-being, depression, anxiety, and stress. Job demands were further broken down into acute stressors (GARS) and chronic stressors (perceived work demands). Previous research on the effect of age and shift work has shown that older emergency service personnel have lower reported levels of well-being. Based on the previous literature, the following hypotheses are proposed;

H₁. Shift work, age, and two types of job demands (acute and chronic) will negatively predict well-being and positively predict depression, anxiety, and stress.

H₂. Self-efficacy and social support will positively predict psychological well-being and negatively predict depression, anxiety, and stress

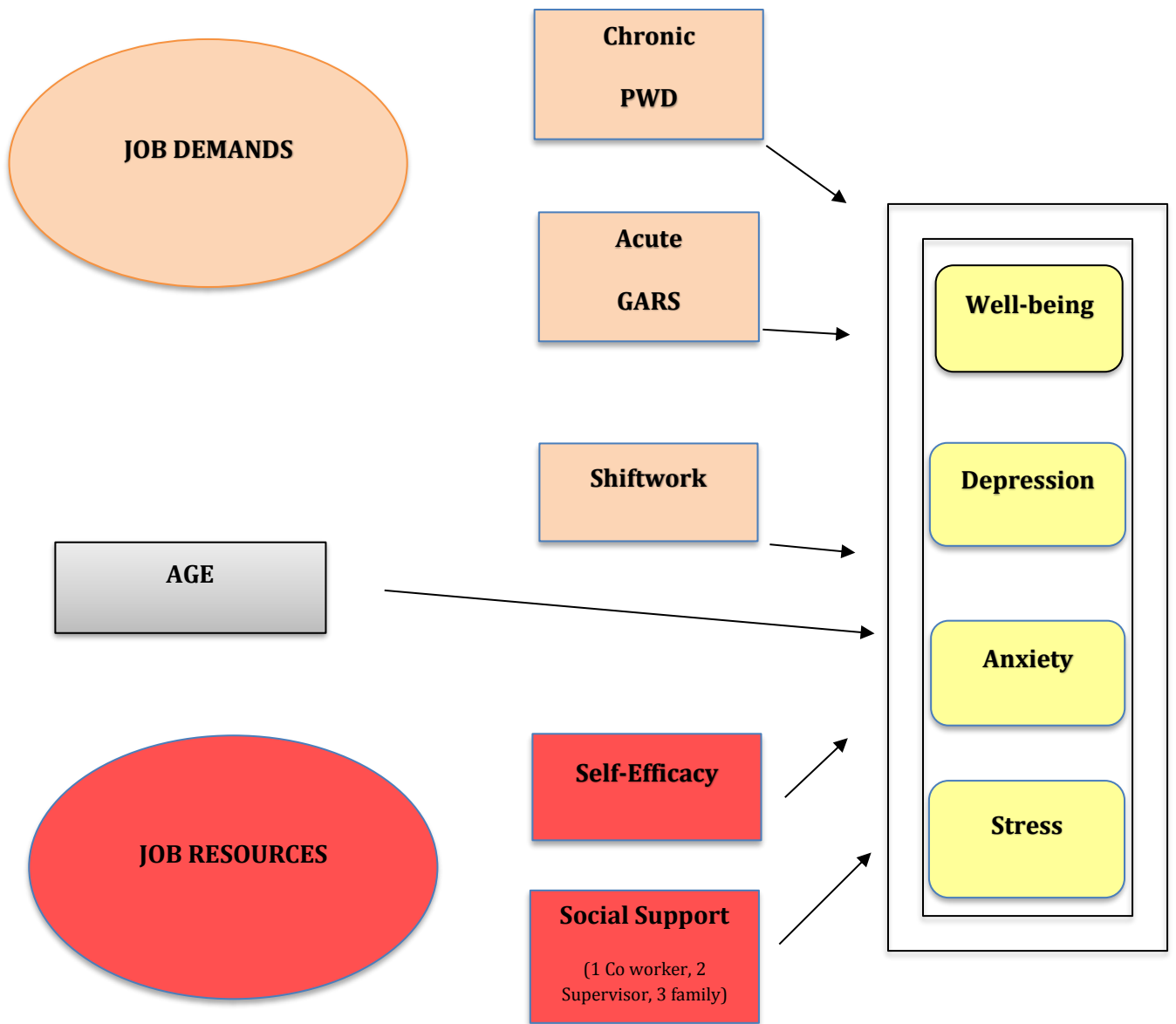


Figure 1. Overview of the research model showing effects of job resources (social support; self-efficacy), job demands (Acute GARS; Chronic PWD & shiftwork), and age on well-being, depression, anxiety, and stress.

METHOD

Eighty-one QFES Fire Com officers completed the questionnaire with one participant excluded because of incomplete data and another excluded because of potentially influential scores. The final sample consistent of 79 participants (29 male, 50 female). Their ages are given in Table 1.

Table 1

Age bracket groups showing number and percent of participants for each category

Age (years)	N	%
21 - 30	16	19.75
31 - 40	28	34.57
41 - 50	25	30.86
51 - 55+	12	14.81

Of these, 25.9% indicated having over 15 years of service with QFES, 6.2% had between 12-15 years service, 9.9% between >10 - 12 years; 13.6% between >8 - 10 years; 14.8% between >6 - 8 years; 9.9% between >4 - 6 years; 12.3% between >2- 4 years; 3.7% between >1 - 2 years and 3.7% between 3 months and 12 months service. Weekly shift rotation was identified by either, 1) Day work - 8am to 6pm, or 2) Night shift 6pm to 8am with nearly half of the sample (48.75%) indicated they worked more than 48 hours of night shift in a fortnight. Eighty one per cent of participants identified as employed full-time, with 10.1% part time and 8.7% identifying as casual. There were no incentives offered for completing the survey.

MEASURES

Warwick Edinburgh Mental Well-being Scale (WEMWBS; Tennant, Hiller, Fishwick, Platt, Joseph, Weich, & Stewart-Brown, 2007). The WEMWBS is a scale of 14 positively worded items, with five response categories, for assessing mental wellbeing. Participants were asked to rate the extent to which they have experienced each state *over the past 6 months*. Tenant et al. (2007) showed the WEMWBS is a short and psychometrically robust scale, and with a Cronbach's alpha score of $\alpha = 0.89$ and high correlations with other mental health and well-being scales.

Depression, Anxiety Stress Scale (DASS; Lovibond & Lovibond, 1995). The DASS 21 is a 21item self-report questionnaire designed to measure severity of symptoms of the negative emotional states of depression, anxiety, and stress. Subjects use 4-point scales to rate the extent to which they have experienced each state *over the past 6 months*, ranging from 1 (*Did not apply to me at all over the last 6 months*) to 4 (*Applied to me very much or most of the time over the past 6 months*). Scores are calculated by summing the responses to the relevant items, with high scores indicating higher levels of depression, anxiety, and stress. The DASS-21 has been shown to be psychometrically sound with good reliability

and validity (Oei, Sawang, Goh, & Mukhtar, 2013) with Cronbach Alpha scores for the depression scale at $\alpha = 0.91$, the anxiety scale at $\alpha = 0.84$, and the stress scale at $\alpha = 0.90$ (Lovibond & Lovibond, 1995).

Perceived Work Demands Scale (PWD; Boyar, Carr, Mosley, & Carson, 2007). This 5-item self-report questionnaire is designed to measure workers' perceptions of their experience in their place of work. Responses are given on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) to rate their experiences *over the past 6 months*. Higher scores indicate higher levels of perceived work demands. The scale has a reliability coefficient of Cronbach alpha score of $\alpha = .83$ (Olowodunoye & Adebayo, 2015). The scale has a reliability coefficient of Cronbach alpha score of $\alpha = .83$ (Olowodunoye & Adebayo, 2015).

Greater Alarm Response System (GARS; QFES, 2016). This is the QFES response level to an emergency incident and is recorded in both QFES emergency services computer aided dispatch (ESCAD) and Operations Management (OMS) systems. A second alarm requires significantly more resources and places higher acute job demands on FireCom officers. Therefore, as a measure of acute demands, this study asked specifically the number of second alarm responses FireCom officers had experienced in the last 6 months. This information was self-reported and could be sourced from ESCAD records to ensure accuracy, with mean of 3.91 (SD 1.74).

Shift work Night shift in QFES is between 6pm and 8am, with fulltime FireCom officers' rostered two consecutive night shifts in a 4 day rotation, also known as a "tour". This study asked how many hours of night work (between 6pm and 8am) FireCom officers averaged in a two-week period and then categorised into over 48 hours (fulltime) or less than 48 hours (part-time).

The Occupational Self-Efficacy Scale (OCCSEFF; Schyns & von Collani, 2002) is a specific measure of self-efficacy in the occupational domain that has shown to be a reliable, one-dimensional scale that has acceptable construct and criterion validity (Schyns & von Collani, 2002). The OCCSEFF includes eight items and has been shown to have good validity when compared with general measures of general self-efficacy such as The Self-Efficacy Scale (Sherer, Maddux, Mercandante, Prentice-Dunn, Jacobs, & Rogers, 1982) and a Cronbach's alpha coefficient of $\alpha = .90$ (Rigotti, Schyns & Mohr, 2008).

Social support (Caplan, Cobb, French, Van Harrison, & Pinneau, 1980). This scale includes subscales that measured the support an employee perceives is available from their 1) co-workers, 2) supervisor, and 3) spouse and family/friends. It assesses the extent to which these three sources go out of their way to help an employee, are easy to talk to, can be relied on when things get tough on the job, and are willing to listen to an employee's personal problems. The present study, a 6 month time-frame was specified. Items are rated on 5-point scale from 4 (*Very much*) to 0 (*Don't have any such person*). Responses are averaged to form totals for each subscale, and then the three subscales are summed to give an overall social support score. High scores indicate high levels of received social support in each case. The 4-item scales have reported coefficient alpha of $\alpha = .86$ for co worker, $\alpha = .86$ for supervisor support, and $\alpha = .87$ for family and friends (Frese, 1999).

Age Previous research has shown that people older than 40 years seems to be less adaptable to shift work and experience lower overall well-being (Reid & Dawson 2001), therefore age was dummy coded into 1 = over 40 years and, 0 = under 40 years.

PROCEDURE

All QFES FireCom officers with a minimum of three months service were eligible to participate in this research. Participants were recruited via a web link emailed to their work intranet email address by the South East Region HR department. This approach was taken to ensure that participants remained anonymous to the researcher, who was also an employee of the QFES. Individuals who wanted to participate were asked to click on a link that took them to the online survey, hosted by the website 'SurveyMonkey'. Upon accessing the survey, participants viewed an information sheet that provided details about confidentiality, anonymity, the risks and benefits of the study, and the ability to withdraw without penalty. Subsequent completion of the questionnaire, which took approximately 15 minutes, indicated informed consent. A second email with the survey link was sent out to all Fire Com officers two weeks after the first email either thanking them for their participation or asking for completion. Responses were received from 81 of the approximately 110 FireCom officers originally contacted, a response rate of 73%.

RESULTS

All statistical procedures were conducted using SPSS Version 22. The data analyses that were conducted included missing data analyses, reliability analyses, bivariate correlations, and regression analyses. Descriptive statistics for each of the variables can be seen in Table 1, and correlations can be seen in Table 2.

Table 1

Descriptive Statistics for Study Variables (N = 79)

Variable	M (SD)	Actual Scores Range	Possible Range of Scores
GARS	3.91(1.74)	2.00 – 6.00	1.00 – 6.00
Job demands	4.07 (0.58)	1.28 – 5.00	1.00 – 5.00
Self-efficacy	2.91 (0.57)	1.73 – 4.56	1.00 – 6.00
Social support (total)	13.21(1.88)	8.00 –16.00	1.00 – 48.00
Well-being	3.06 (0.45)	1.75 – 4.37	1.00 – 6.00
Depression	1.47 (0.48)	1.00 – 3.57	1.00 – 4.00
Anxiety	1.28 (0.40)	1.00 – 3.14	1.00 – 4.00
Stress	1.73 (0.49)	1.00 – 3.28	1.00 – 4.00

Regression analysis. Four standard multiple regression analyses, one per dependent variable, were carried out to investigate the factors that predict the mental health of FireCom officers. All analyses included GARS, job demands, shift work, age, self-efficacy and total social support as predictors.

Well-being. GARS, job demands, shift work, age, self-efficacy and social support together explained 32.4% of the variance in well-being, $F(6, 72) = 5.74, p < .005$. Significant unique contributions to the explanation were made by age ($\beta = -.25, p = .016$) and social support ($\beta = .43, p < .005$) but not GARS, job demands, shift work or self efficacy. Thus, better wellbeing in Firecom officers can be explained by being younger (under 40 years) and receiving higher social support.

Depression. The predictors together explained 29.2% of the variance in depression, $F(6, 72) = 4.95, p = .000$. Significant unique contributions to the explanation were made by GARS ($\beta = .27, p = .015$) and social support ($\beta = -.47, p = .000$) but not job demands, self efficacy, age or shift work.

Anxiety. The predictors together explained 17.3% of the variance in anxiety, $F(6, 72) = 2.50, p = .029$. Significant unique contributions to the explanation were made by job demands ($\beta = -.24, p = .041$) but not GARS age, self efficacy, shift work or social support.

Stress. The predictors together explained 29.1% of the variance in stress $F(6, 72) = 4.93, p = .000$. Significant unique contributions to the explanation were made by job demands ($\beta = .25, p = .020$) and social support ($\beta = -.37, p = .003$) but not GARS, shift work, age or self efficacy.

SUMMARY OF FINDINGS

Results provide partial support for the both hypotheses; however all four models were found to be significant with differing amounts of the variance in outcomes explained. As expected, and consistent with findings from JD-R theory and previous job demands research, higher acute job demands (GARS) was associated with higher levels of anxiety and stress. Higher chronic job demands was also found to be a significant predictor of stress. The current study found older age (>40 years) FireCom officers reported lower well-being than their younger counterparts. However, contrary to previous research, no support was found for the negative effects of shift work on overall well-being.

Partial support was also found for the second hypothesis, with FireCom officers with higher total social support reporting higher levels of well-being and lower levels of depression and stress. Further analyses showed that support from family in particular, predicted higher wellbeing and lower levels of stress, depression and anxiety. Again, contrary to previous research self efficacy did not negatively predict lower levels of depression, anxiety, and stress. It did however, positively predict well-being.

Table 2

Bivariate Correlational Matrix for All Variables Used in Analyses (N = 79)

	Well-Being	Depression	Anxiety	Stress
GARS	-.14	.26*	.20	.26*
PWD	-.01	.16	.27*	.35**
Shiftwork	-.07	.00	.08	.12
Age	-.22*	.21	.24*	.15
Self-efficacy	.26*	.04	.16	.02
Social support	.46**	-.37**	-.09	-.34**

Note. Age was dummy coded into 1= over 40 years; 0 = under 40 years. Shift work was dummy coded into 1 = full time; 0 = part time. Job demands and self-efficacy have been square root transformed and reflection. Depression, anxiety and stress has been square root transformed.

* $p < .05$. ** $p < .01$. *** $p < .001$.

It was hypothesised that higher job demand both acute (GARS) and chronic (PWD) would negativity predict well-being and positively predict depression, anxiety and stress. A significant positive moderate correlation was found between job demands (chronic) and anxiety and stress. A significant positive moderate correlation was also found between GARS (acute) and depression and stress. Consistent with the JD-R model, the current study

found higher job demands lead to higher levels of depression, anxiety, and stress. Previous research has shown that chronic job demands and acute job demands have been found to differ on the impact they have on workers performance and to the development depression and anxiety (Beehr & Franz, 1987). The current study also found support for the association between job specific demands and negative outcomes, with acute job demands (GARS) negatively predicting stress and chronic job demands negatively predicting both anxiety and depression.

DISCUSSION

While there has been much research on frontline emergency service workers, the current study aimed to fill the gap in the literature by assessing factors that affect overall well-being of FireCom officers. Despite the stressful nature of their role, there has been little published research investigating psychological well-being or depression, anxiety and stress among this population. The Queensland Fire and Emergency Services is the primary provider of fire and emergency activities in Queensland. Given that FireCom officers provide an important service to the community and are the first link between the public and emergency services, it is important that the overall well-being of Fire Com officers be monitored and enhanced where needed.

Despite many well-documented studies showing the negative effects of shift work on daily health (Clendon & Walker, 2013), cognitive (Folkard, 1996), biological, psychological and social (Rouch, Wild, Ansiau & Marquie, 2005) factors, the current study found no link between shift work and FireCom officers well-being, depression, anxiety or stress. During a 14 hour night shift, up to 4 hours of “fatigue management” or short naps can be utilised by FireCom officers, which may account for the inconsistent results with previous negative reports on effects of shift work. Saksvik, Bjorvatn, Hetland, Sandal & Pallesen (2011), study found that there are a variety of individual factors that determine a individuals ability to cope with shiftwork, suggesting that some individuals are less affected by shift-work than others. As the majority of the participants in the current study are female, Sheilds, 2002 study found that females have a greater ability to cope with night work and are more likely than males to work these schedules to care for family.

Contrary to the hypothesis and previous finding the current study, self-efficacy was not a significant predictor of well-being or depression, anxiety or stress. A significant moderate positive correlation was found between self-efficacy and well-being. A low mean score was also found suggesting FireCom officers overall reported low levels of self-efficacy. A literature review by Smith, Fuqua, Choi, & Newman, (2007), showed that role ambiguity can have a negative impact on employees and their general self-efficacy, as well as their satisfaction in their position and with the organisation. With recent introduction of the new government wireless network (GWN) digital communication system, FireCom officers’ routine tasks have become more complex and challenging. Stajkovic and Luthans (1998) found that task complexity moderated the relationship between self-efficacy and work-related performance, perhaps offering another reason why self-efficacy was not a significant predictor in overall well-being.

Consistent with the hypothesis and previous research social support was found to positively predict well-being, indicating that the more social support FireCom officers reported the higher their overall well-being and lower reported levels of depression and stress.

STRENGTHS AND LIMITATIONS

An acknowledged limitation of the present research is the relatively small sample size on which the results are based ($N = 79$). Due to this low sample size and the number of

predictors, no interaction effects were carried out for the current study. Another limitation of this research is due to the problems associated with response-bias and common-method variance; common problems with questionnaire-based research. However, self-report was the most feasible and precise way to measure the constructs in this study, and having the QFES Human Resources Department distributed the survey ensuring the privacy of the respondents, which was expected to reduce the potential for self-report bias. Another consideration is the dependent variable measures were not context specific, which may influence the way Firecom Officers reported levels of overall well-being.

One of the strengths of the study was the high response rate therefore, the respondent characteristics were considered to represent the general characteristics of this organisation. However, it is acknowledged that the inclusion of a larger initial sampling pool would also improve the reliability and generalisability of the reported results to include all other emergency dispatch agencies. The ability to be able to access a normally difficult to reach sample would also be considered a unique strength for the current study. Another strength is the use of both positive and negative dependent variables to gain an overall and comprehensive measure of overall well-being of FireCom officers. Finally, another strength is the deaggregation of job demands to include a measure of both chronic and acute job demands expanding on previous JD-R research. Social support was also expanded to include family, colleague and supervisor support giving more specific categories.

CONCLUSION

The Queensland community needs the skilled support of every first responder it can get – and we need them to be mentally healthy and well. QFES Fire Com officers need to be flexible, compassionate, efficient and knowledgeable to deal with their tasks. Their challenging job requires a responsible attitude, the ability to cope with stress, patience and a wide range of personal and professional knowledge. Like any other workers, they may also experience workplace stressors, such as excessive and challenging workloads, inadequate support and changes to work systems and policies. Individual qualities and abilities also play a role in how people respond to stressful situations at work (Judge & Bono, 2001). Most first responders manage the challenges of the job well, and have the ability to endure, adjust and recover from the stress and adversity associated with their role. Promoting well-being and investing in mental health also makes good business and operational sense - low absenteeism, increased productivity and improved worker engagement (Hobson & Beach, 2000). Workers with high levels of mental health and wellbeing are not only happier and healthier, but also more productive and likelier to stay in the workforce despite any challenges life may throw at them (Deci & Ryan, 2008). This research demonstrated that social support had a greater impact on overall well-being, particularly support from family. It also highlights the importance of considering training and education in self-efficacy as well as providing support and more training around the introduction of new technology and organisational change.

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APPENDIX A

Shows the resources associated with each alarm level for the different emergency incidents

GARS South East Queensland Model (BR, SER)						
Incident type	1 st Alarm	2 nd Alarm	3 rd Alarm	4 th Alarm	5 th Alarm	4 th Alarm or higher
Structure Fire	First alarm response is as regional mobilisation protocols	4 x pumpers 1 x control vehicle 1 x Command Officer	6 x pumpers 1 x control vehicle 1x aerial 1 x BAHazmat 2 x Command Officer	8 x pumpers 1 x control vehicle 1 x rescue 1x aerial 1 x BA Hazmat 1 x scientific 3 x Command Officer	10 x pumpers 1 x control vehicle 1 x rescue 1x aerial 1 x BA Hazmat 1 x scientific 4 x Command Officer	2 x additional pumpers per alarm
Non-Structure fire (e.g. wildfire)		4 x pumpers or 4 x RFB 1 x control vehicle 1 x Command Officer	6 x pumpers or 6 x RFB 1 x control vehicle 2 x Command Officer	8 x pumpers or 8 x RFB 1 x control vehicle (or ICC) 3 x Command Officer RFCC – watching brief state air desk notified	10 x pumpers or 10 x RFB 1 x control vehicle (or ICC) 4 x Command Officer RFCC – watching brief SOCC state air desk notified	2 x additional pumpers per alarm
Rescue		3 x pumpers + 1 rescue 1 x control vehicle 1 x Command Officer	4 x pumpers + 2 rescue 1 x control vehicle 2 x Command Officer	6 x pumpers + 2 rescue 1 x control vehicle 3 x Command officer RFCC – watching brief	8 x pumpers + 2 rescue 1 x control vehicle (ICC) 4 x Command officer RFCC – watching brief SOCC – watching brief	2 x additional pumpers per alarm
Hazmat		3 x pumpers + 1 BAHazmat 1 x control vehicle 1 x scientific` 1 x Command Officer	5 x pumpers + 1 BAHazmat 1 x control vehicle 1 x scientific` 1 x decon unit 2 x Command Officer	6 x pumpers + 2 BAHazmat 1 x control vehicle 1 x decon unit 1 x scientific` 3 x Command Officer	8 x pumpers + 2 BAHazmat 1 x control vehicle (or ICC) 1 x decon unit 2 x scientific` 4 x Command Officer	2 x additional pumpers per alarm