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A comparison of nurse shift workers' and non-shift workers' psychological functioning and resilience

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Abstract

Aims: To investigate the impact of shift work on the psychological functioning and resilience of nurses by comparing nurses who work shifts and nurses who work regular hours.

Design: A comparative descriptive design using an online self-report questionnaire.

Method: Data were collected from employed Registered and Enrolled Nurses (N = 1,369) who were members of the Queensland Nurses and Midwives Union (QNMU) in 2013. The survey included standardized measures of resilience, depression, anxiety, compassion satisfaction, compassion fatigue, and intention to leave the profession.

Results: Generalized Linear Mixed Model analysis revealed shift workers had significantly lower levels of compassion satisfaction. However, there were no significant differences between the groups on resilience, depression, anxiety, stress, compassion fatigue or intention to leave nursing.

Conclusion: The findings suggest that shift work is not associated with worse psychological functioning or lower resilience in nurses. However, this study requires replication using a longitudinal design to confirm these findings.

KEYWORDS

anxiety, burnout, compassion fatigue, compassion satisfaction, depression, nursing, psychological outcomes, resilience, shift work, stress

1 | INTRODUCTION

Shift work is a common aspect of nursing profession. While there are some perceived benefits to shift work, such as a higher salary and flexible work schedules, there are also distinct disadvantages, both physical and psychological (Estry-Béhar & Beatrice, 2012; Lin, Liao, Chen, & Fan, 2014; Shahriari, Shamali, & Yazdannik, 2014). Most studies exploring the effect of shift work on nurses have focused on the physical outcomes (Matheson, O'Brien, & Reid, 2014; Niu et al., 2011), with limited attention to examining the psychological impacts (Tahghighi, Rees, Brown, Breen, & Hegney, 2017). It has

been reported that nurses' dissatisfaction with their working conditions, including shift work, is associated with their intention to leave the profession, which is a factor in workforce shortages, particularly with respect to the loss of experienced nurses (Nei, Anderson Snyder, & Litwiller, 2015; Rossi et al., 2012). These concerns about nursing shortages and the known influence of shift work on the workforce (Tahghighi et al., 2017; Tuckett, Hegney, Parker, Eley, & Dickie, 2011) highlight the need for studies to investigate the impact of working shifts on nurse psychological functioning. These phenomena are of interest to nurse leaders and policy makers, as both patient safety and the quality of nursing care patients receive are

affected by absenteeism and staff turnover (International Council of Nurses, 2007).

1.1 | Background

Research suggests that shift work can be associated with a limited social life, reduced job satisfaction, elevated levels of anxiety, work/family conflict, emotional exhaustion, low levels of well-being, burnout, and poor mental health (Jung & Lee, 2014; Lin et al., 2014). In a recent integrative review of studies examining the impact of shift work on the psychological functioning of nurses, mixed results were reported with some studies finding generally poor mental health, poor quality of life, and low psychological well-being, while others reported no relationship between working shifts and negative psychological outcomes (Tahghighi et al., 2017). These authors concluded that the lack of longitudinal studies that make comparisons between shift and non-shift working nurses, limits conclusions that can be made, and recommended further research using consistent measures across nursing contexts to better understand the impact of shift work and other contextual factors on the psychological functioning of nurses.

There are several negative psychological impacts of working shifts that are considered in this study. These include stress, depression, anxiety, and compassion fatigue (comprising secondary traumatic stress [STS] and burnout), all of which influence decisions about employment. A high level of resilience, even in the face of adverse or undesirable work conditions, is associated with nurse retention (Grafton, Gillespie, & Henderson, 2010). Studies have also found a significant positive association between resilience and compassion satisfaction (CS) (Drury, Craigie, Francis, Aoun, & Hegney, 2014; Hegney et al., 2014). Compassion satisfaction is defined as feeling satisfied as a result of being able to assist others (Stamm, 2002), or having the ability to do the work well (Stamm, 2010). Given the association between resilience, compassion fatigue, burnout, depression, anxiety, and stress and the limitations of previous studies, investigating the effect of shift work on these constructs among nurses is warranted.

2 | THE STUDY

2.1 | Aims

The aims of this study were to investigate the impact of shift work on the psychological functioning and resilience of nurses and to determine whether nurses who work shifts have different mental health/professional quality of life outcomes compared with those who work regular hours. Conceptually, the study aligns with the evidence-based, theoretical model of the International Collaboration of Workforce Resilience (ICWR-1) (Rees, Breen, Cusack, & Hegney, 2015). This model identifies resilience as a key variable having an impact on psychological outcomes such as depression, anxiety, stress, and compassion fatigue. The model focuses on individual difference variables that along with resilience, help to explain negative psychological reactions to work stressors. In this study, we have included a direct measure of resilience (Connor-Davidson Resilience Scale) as well as measuring key

What problem did the study address?

- Previous studies reported mixed findings about the psychological impact of shift work and do not directly compare nurse shift workers with non-shift workers.

What are the main findings?

- Shift work did not have deleterious effects on nurses' psychological states or intention to leave the profession. Shift work did affect compassion satisfaction, which may influence the quality of care.

Where and on whom will the research have an impact?

- Despite the increasing international concern, shift work may not be a key driver of attracting and retaining the nursing workforce.

psychological outcomes (depression, anxiety, stress, compassion satisfaction, and fatigue). The decision to investigate the impact of shift work in relation to resilience was made because sample evidence suggests that shift work is a significant work place stressor.

In line with this framework, it was hypothesized that there would be a significant positive relationship between resilience and CS and significant negative relationships between resilience, compassion fatigue, depression, anxiety, and stress among nurses who work shifts. Further, it was predicted that nurses working shifts would have significantly higher scores on compassion fatigue (STS, burnout) compared with nurses who are not working shifts (hypothesis 2); and nurses working shifts would have significantly higher scores on depression, anxiety, and stress compared with nurses who are not working shifts (hypothesis 3). We also hypothesized nurses working shifts would have significantly lower scores on CS (hypothesis 4) and lower scores on resilience (hypothesis 5) compared with nurses not working shifts. Finally, it was hypothesized that nurse shift workers would indicate an intention to remain in the profession significantly fewer years compared with non-shift workers (hypothesis 6).

2.2 | Design

This is a comparative descriptive research study which investigated the impact of shift work on resilience and psychological functioning of nurses.

2.3 | Sample/Participants

This study analysed data collected in 2013, by Hegney, Francis, & Eley from a stratified random sample of members of the Queensland Nurses and Midwives Union (QNMU). This was the fifth study, replicating others undertaken in 2001, 2004, 2007, and 2010 (Hegney, Francis, & Eley, 2013). The 2013 study enabled the QNMU to publish the first workforce study with long-term

comparative data. To conduct a stratified random sample survey, an invitation was emailed by the QNMU to 13,739 selected members, of which 2,857 responded.

2.4 | Data collection

Participants were required to respond to both structured (measures) and unstructured (open-ended) questions. The online self-report survey consisted of 168 questions which addressed the current employment; work status; working conditions; responsibilities outside work; professional development; future in nursing; personal experiences; and strategies, issues, and QNMU support.

The survey was completed by the QNMU members in aged care, private, and public sectors. The union represents two thirds of Queensland's Enrolled and Registered Nurses (Hegney et al., 2013). This study included only employed Registered Nurses and Enrolled Nurses as their scope of practice is different from Assistants in Nursing, Midwives, and Student Nurses. Therefore, data from later mentioned participants were not analysed (Hegney et al., 2013).

2.5 | Ethical considerations

Research Ethics Committee approval was obtained by the University Human Research Ethics Committee in 2013. An ethics amendment was later approved by the same committee in 2015 to enable the researcher access to the already collected data.

2.6 | Data analysis

The data were analysed to compare resilience scores as well as scores on the other psychological outcome measures between nurse shift workers and non-shift workers. The data were also sorted by the sector (public, private, and aged care) where nurses were working. The researchers also tested the data for normality and found that it was violated among resilience, depression, anxiety, stress, compassion fatigue, and CS variables. Thus, non-parametric analyses such as bivariate correlation (Spearman rho) analysis (Acock, 2012; Allen, Bennett, & Heritage, 2014) and GLMM were used. To address the research hypotheses, a database was created from the original data set (using SPSS version 22) according to the exclusion and inclusion criteria.

Hypothesis 1 was tested using bivariate correlation (Spearman rho) analysis (Acock, 2012; Allen et al., 2014). Hypotheses 2-3 were tested within the context of a Shift (yes, no) \times full time (full time, part-time) \times Gender (male, female) design. Rather than control for full time and gender, they were included as factors in the analysis to test whether they moderated the impact of working shifts on the outcome measures.

Eight GLMMs were developed, one for each of the dependent variables (burnout, CS, STS, stress, anxiety, depression, resilience, and the number of years the nurses intended to remain in the profession). The GLMMs were implemented through SPSS's GENLINMIXED procedure. The GLMM represents a special class of regression model. The GLMM is 'generalized' in the sense that

it can accommodate outcome variables with markedly non-normal distributions; the GLMM is 'mixed' in the sense that it includes both random and fixed effects. For the present GLMMs, there was one nominal random effect (participant), three nominal fixed effects (shift, full time, gender), three two-way interactions (Gender \times Shift, Gender \times Full Time, Shift \times Full Time), and one three-way interaction (Shift \times Full Time \times Gender). Covariates were entered as additional fixed effects. Potential covariates were trait negative affect, age, experience in nursing, and sector. The effective sample size for the GLMMs was 1,369.

2.7 | Validity, reliability, and rigour

The survey included five measures with adequate psychometric evidence to be used in the study.

Professional Quality of Life (ProQoL) Scale version 5 was used to measure compassion fatigue (STS and burnout) and CS (Stamm, 2010). It uses a five-point item Likert scale (1-never to 5-very often) to measure the three subscales (10 items each). The mean score for subscales (T-Scores) is 50 with a standard deviation of 10. Alpha scale reliability is 0.88 for CS, 0.75 for burnout and 0.81 for STS (Stamm, 2010). It has been used internationally and also has been psychometrically validated in different studies for various target populations (Stamm, 2010). The internal reliability for the CS, STS, burnout scales was 0.91, 0.82, and 0.85 respectively.

The Depression, Anxiety and Stress (DASS21) Scale (Lovibond & Lovibond, 2002) is a shorter version of the DASS 42 and represents all three subscales. The alpha value, in the normative sample ($N = 717$), for Depression is 0.91; Anxiety is 0.84 and Stress is 0.90 in the 14-item scales (Lovibond & Lovibond, 2002). The reliability and validity of this scale have been tested by many researchers and support found for the internal consistency and construct validity of this scale (Mahmoud, Hall, & Staten, 2010; Sinclair et al., 2012). The internal reliability for the depression, anxiety, and stress scales was 0.92, 0.86, and 0.89 respectively.

The Connor-Davidson Resilience (CD-RISC) Scale (Connor & Davidson, 2003) is a commonly used 25-item scale measuring resilience. It has a rating scale from 1 to 5, with a higher score indicating greater resilience (Ahern, Kiehl, Sole, & Byers, 2006). The mean score for this scale was reported to be 80.4 ($SD = 12.8$) (Connor & Davidson, 2003), which can vary across populations and be affected by age. Its reliability and validity have been tested and supported in numerous studies (Ahern et al., 2006; Connor & Davidson, 2003). Connor and Davidson, 2003 obtained a test-retest reliability correlation coefficient of 0.90. The internal reliability for the CD-RISC was 0.94.

Spielberg State-Trait Anxiety Inventory Trait Scale (STAI) (Spielberger, 2010) was used to measure participants' trait anxiety level. This measure was included to control for the trait anxiety among the participants. STAI contains two subscales of State-Anxiety (S-Anxiety) and Trait-anxiety (T-Anxiety) and 40 items. Each subscale includes 20 items. The mean score of the scale among working adults for S-Anxiety and T-Anxiety is 35.72 and 34.89 respectively.

TABLE 1 Comparison between shift workers and non-shift workers in terms of age, years of experience, sector worked, shifts, and gender

Outcome variable	Shift workers (N= 1,046)	Non-shift workers (N= 449)
Age (M [SD])	46.81 (11.50)	50 (9.99)
Experience (M [SD])	19.44 (13.44)	25.30 (12.67)
Sector		
Public sector acute (%)	33.10	25.70
Private sector acute (%)	38.80	26.00
Public community health (%)	1.10	11.30
Private community health (%)	1.20	4.50
Private domiciliary nursing (%)	0.30	0.70
Public sector age care (%)	2.60	4.50
Private sector aged care (%)	17.90	21.70
Nursing agency (%)	0.80	0.00
Other (%)	4.2	5.60
Shifts		
Three shifts (a.m, p.m, night) (%)	47.39	0.0
Day (6 a.m. to 6 p.m.) (%)	0.00	97.84
Evening shift only (%)	7.10	0.0
Night shift only (%)	7.10	0.0
Morning and evening shift (%)	31.00	0.0
Evening and night shift (%)	2.51	0.0
Other (%)	4.90	2.16
Gender		
Female (%)	91	94
Male (%)	9	6

The test-retest coefficients ranged from 0.31 to 0.86 (Spielberger, 2010). The internal reliability for STAI was 0.92.

3 | RESULTS

3.1 | Sample characteristics

The two groups of shift workers and non-shift workers differed in terms of age, experience, sector worked, and gender (see Table 1). The cohort of nurse shift workers was younger and had less years of experience than non-shift workers. Almost two thirds of the nurse shift workers worked part-time (65.4%), one third worked full time (31.8%). The remainder worked temporary full time (0.5%) and temporary part-time (2.3%). The percentage of nurse non-shift workers who worked full time (50%) was almost like those who worked part-time (46.4%). The remainder worked temporary full time (2.2%) and temporary part-time (1.4%). Casual workers ($N = 121$) were excluded from all analyses because of their low levels of representation. Most nurses had Australian citizenship (87.8%). Most (59.2% of shift workers and 68.1% of non-shift workers) had dependants, mainly children.

3.2 | Correlations among variables: Hypothesis 1

As predicted, significant negative correlations were observed between resilience, STS, burnout and depression, anxiety, and stress (Table 2). Conversely, as predicted, a large, significant positive relationship was observed between resilience and CS. The medium to large, significant correlations found between resilience, depression, anxiety, stress, CS, STS, and burnout supported hypothesis 1.

3.3 | GLMM analyses: Hypotheses 2–6

The results of the GLMM analyses are presented in Table 3. As age and experience were significantly correlated with all the dependent variables they were entered as covariates in all of the GLMM analyses. Additionally, as sector was significantly correlated with CS and years remaining in profession, sector was entered as an additional covariate for these two GLMM analyses.

As can be seen in the table, only one hypothesis was supported; that of CS. For CS, the Gender \times Shift interaction was significant ($F [1, 1333] = 6.55, p = 0.011$). The interaction is plotted in Figure 1. The simple main effects of shift work were tested separately for men and women. Female shift workers reported significantly less CS than female non-shift workers ($F [1, 1333] = 6.33, p = 0.012$), whereas male shift workers reported significantly more CS than male non-shift workers ($F [1, 1333] = 4.27, p = 0.039$). There were no significant main effects for shift ($F [1, 1333] = 2.19, p = 0.139$) or full time ($F [1, 1333] = 0.02, p = 0.896$). There was a significant main effect for gender ($F [1, 1333] = 14.03, p < 0.001$) indicating that women reported significantly more CS than men, regardless of whether they worked shifts. None of the other GLMMs were significant.

4 | DISCUSSION

This study compared nurse shift workers and non-shift workers directly, using a specific measure of resilience and also measuring other indicators of psychological functioning. The sample was broadly representative of Australian nurse professionals in terms of age, gender, and sector worked, as the nursing workforce in Australia is ageing with 42.7% of the nursing workforce aged 50 years and over (Australian Institute of Health & Welfare, 2011–2015). After statistically equating the shift and non-shift working nurses in terms of covariates, only one of the outcome measures showed a significant difference between groups: shift workers had significantly less CS. There were no significant differences between shift and non-shift workers on any of the other outcomes. Given the large sample size, these null effects cannot be attributed to low power and should therefore be of interest to researchers and stakeholders in this area.

The result of the first hypothesis of this study aligns with those found in other studies (Cragie et al., 2016; Hegney et al., 2014; Hegney, Rees, Eley, Osseiran-Moisson, & Francis, 2015). As predicted, the more resilient nurse shift workers were the more CS they had and the less resilient they were the more depression, anxiety,

TABLE 2 Bivariate correlations (Pearson) between DASS, CDRISC and ProQoL subscales

Variable	DASS stress	DASS anxiety	DASS depression	PROQOL5 CS	PROQOL5 STS	PROQOL5 BO	CD-RISC resilience
DASS stress		00.69 ^a	0.73 ^a	-0.29 ^a	0.54 ^a	0.56 ^a	-0.40 ^a
DASS anxiety			0.61 ^a	-0.27 ^a	0.49 ^a	0.47 ^a	-0.37 ^a
DASS depression				-0.39 ^a	0.49 ^a	0.61 ^a	-0.49 ^a
PROQOL5 CS					-0.23 ^a	-0.69 ^a	0.61 ^a
PROQOL5 STS						0.55 ^a	-0.34 ^a
PROQOL5 BO							-0.60 ^a

^aCorrelation is significant at 0.01 levels (two-tailed). $r = 0.10$ to 0.29 small; $r = 0.30$ to 0.49 medium; $r = 0.50$ to 1.00 large correlation (Cohen, 1988), $n = 958$.

stress, STS, and burnout they had. CS refers to the pleasure one derives from helping others (Stamm, 2002) and translates to the delivery of high-quality care. On the other hand, low CS can lead to decreases in the quality of patient care (Edéll-Gustafsson, Kritz, & Bogren, 2002; Mealer, Jones, & Moss, 2012). Although CS is not a measure of psychological distress, it is of importance because it suggests that nurse shift workers are deriving less satisfaction from their work than non-shift workers and may have clear ramifications for the quality of care they can provide.

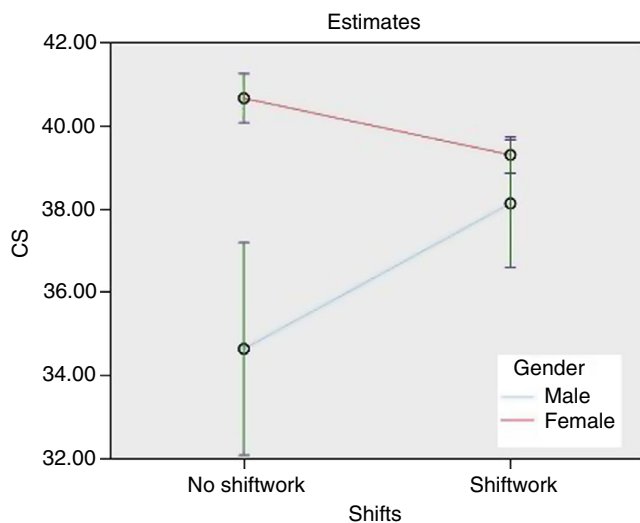
Contrary to hypothesis 2, there were no significant differences in STS and burnout among nurse shift workers compared with non-shift workers. This finding is consistent with a study by Jamal and Baba (1997) who found no significant differences in burnout among nurses working in different shifts. However, the current findings are in contrast to other studies that have found differences in levels of burnout between fixed shift (fixed morning, evening, and night) and rotating shifts (morning, evening, and night) workers (Shahriari et al., 2014; Wisetborisut, Angkurawaranon, Jiraporncharoen, Uaphanthasath, & Wiwatanadate, 2014). Each of these three studies used the Maslach Burnout Inventory which may be an explanation for the inconsistent result due to this tool having a different conceptualization of burnout from ProQoL scale. Maslach defines burnout as the result of mismatches in six areas: workload, control, reward, community, fairness, values, while Stamm defines burnout as a feeling of hopelessness and difficulty coping with work or working effectively. The condition has a gradual onset and can be linked with an increased workload or a lack of support in a work environment (Stamm, 2010). Further, Shahriari et al. and Wisetborisut et al. had different definitions of shift work compared with this study which may explain the outcome discrepancy with the present study.

Hypothesis 3 was also not supported as there was no difference in depression, anxiety, and stress between nurses who worked shifts and those who did not. Further investigation was undertaken to compare the current study sample means of DASS21 subscales with normative data presented in the DASS manual. DASS 21 stress, anxiety, and depression scores in this sample were higher than normative data presented in the DASS manual (Lovibond & Lovibond, 2002). Also, the current sample's means for the ProQoL5 were compared with the means obtained from another sample of Western Australian nurses (Hegney et al., 2014) as well as the Australian general adult population were compared together (Crawford, Cayley, Lovibond, Wilson, & Hartley, 2011) (see Table 4). The mean of ProQoL5 subscales is almost similar for both the current sample and the Western Australian nurses, while the means of the DASS 21 subscales for both the current sample and the Western Australian nurses are higher than the general adult sample of Crawford et al. (2011). This suggests that while there were no differences on this measure between the shift and non-shift workers in this study, the entire group was reporting relatively high levels of depression, anxiety, and stress. In 2013, the government of Queensland proposed legislation to cut the penalty rates (a higher salary rate when an employee works in certain days or times, such as weekends) for working shifts (Queensland Nurses' Union, 2013). This uncertainty may have

TABLE 3 Results of GLMM analyses

Variable	Shift × full time × gender	Shift × gender	Gender × full time	Shift × full time
Burnout	$F [1, 1336] = 0.40,$ $p = 0.527$	$F [1, 1336] = 1.15,$ $p = 0.284$	$F [1, 1336] = 0.32,$ $p = 0.571$	$F [1, 1336] = 0.81,$ $p = 0.368$
STS	$F [1, 1336] = 0.10,$ $p = 0.748$	$F [1, 1336] = 0.34,$ $p = 0.557$	$F [1, 1336] = 0.20,$ $p = 0.657$	$F [1, 1336] = 0.18,$ $p = 0.676$
CS	$F [1, 1333] = 0.70,$ $p = 0.792$	$F [1, 1333] = 6.55,$ $p = 0.011^a$	$F [1, 1333] = 0.21,$ $p = 0.647$	$F [1, 1333] = 0.02,$ $p = 0.647$
Resilience	$F [1, 1336] = 0.21,$ $p = 0.648$	$F [1, 1336] = 3.04,$ $p = 0.081$	$F [1, 1336] = 0.35,$ $p = 0.552$	$F [1, 1336] = 0.37,$ $p = 0.546$
Depression	$F [1, 1336] = 0.43,$ $p = 0.514$	$F [1, 1336] = 1.05,$ $p = 0.307$	$F [1, 1336] = 0.17,$ $p = 0.684$	$F [1, 1336] = 0.06,$ $p = 0.810$
Anxiety	$F [1, 1336] = 0.25,$ $p = 0.618$	$F [1, 1336] = 0.33,$ $p = 0.567$	$F [1, 1336] = 0.79,$ $p = 0.373$	$F [1, 1336] = 1.96,$ $p = 0.162$
Stress	$F [1, 1336] = 0.39,$ $p = 0.531$	$F [1, 1336] = 0.50,$ $p = 0.482$	$F [1, 1336] = 0.13,$ $p = 0.719$	$F [1, 1336] = 0.18,$ $p = 0.668$
Years stayed in nursing	$F [1, 1311] = 0.61,$ $p = 0.436$	$F [1, 1311] = 1.37,$ $p = 0.243$	$F [1, 1311] = 0.98,$ $p = 0.324$	$F [1, 1311] = 0.58,$ $p = 0.449$

^aDifference is significant at $p \leq 0.05$.

**FIGURE 1** Interaction between shift work and compassion satisfaction among nurse shift workers and non-shift workers

negatively influenced the entire sample that reported high levels of depression, anxiety, and stress.

The lack of support for hypothesis 3 is consistent with previous studies. Hoffman and Scott (2003) found similar levels of stress among those who worked 8 hr and 12 hr shifts, after controlling for nurses' years of experience. Ruggiero (2005) reported no difference between types of shifts worked and depression and Berthelsen et al. (2015) reported no association between night shifts and rotating shifts with increased 'caseness' of anxiety or depression. However, the results of the current study contrast those of Hea Young, Mi Sun, Oksoo, Il-Hyun, and Han-Kyoul (2015) who conducted a cohort study and concluded shift work increased the development of severe depression among female nurses. Similarly, Ardekani, Kakooei,

Ayattollahi, Choobineh, and Seraji (2008) reported nurses on fixed day shifts had higher levels of anxiety than those on rotating shifts.

The present study is the first to investigate the impact of shift work on CS. As predicted in hypothesis 4, we found significantly lower levels of CS among nurse shift workers, specifically female nurses, compared with their non-shift worker counterparts. The correlation analysis also revealed CS was significantly positively related to resilience among nurse shift workers. This explains why a nurse shift worker who is less satisfied could be less resilient. There is a need for more investigation to understand how the cohort of female-dominated nurse shift workers cope with their social life as well as work and family commitments, while they are dealing with higher levels of stress, depression, and anxiety compared with other Australian nurse professionals.

The present study found shift work does not have significant effects on the resilience levels of nurses, contrary to hypothesis 5. The relationship between resilience and highlighted psychological outcomes has not been directly studied among nurse shift workers; only a few studies investigated the associations between the variables (Flo et al., 2012; Natvik et al., 2011; Saksvik-Lehouillier et al., 2012, 2013; Samaha, Samaha, Lal, Samaha, & Wyndham, 2007; Storemark et al., 2013). The present findings run counter to the few studies undertaken in the last 21 years. In 2011, Natvik et al. concluded that hardiness (resilience) was negatively associated with depression and anxiety among rotating shift workers. In 2012, Saksvik et al. conducted a longitudinal study and reported hardiness correlated negatively with depression and anxiety at Time 2 (1 year after the first data collection). In 2013, the same authors reported hardiness was positively associated with shift work tolerance among newly graduated nurses and employed nurses who worked shifts (Saksvik-Lehouillier et al., 2013). In the same year, Clendon and Walker (2013) found nurse shift workers used coping strategies to deal with different aspects of working shifts on

TABLE 4 A comparison of current study sample and standard deviations (SD) with Western Australian nurses' mean (Hegney et al., 2014) and (Crawford et al., 2011) normative sample means

Subscale	West Australian nurses' mean (SD) ^a	Current sample Mean (SD) ^b		Crawford et al. ^c Mean (SD)	One sample t test sig. ^d
		Shift workers	Non-shift workers		
CS	35.66 (7.60)	39.17 (6.68)	40.29 (6.15)		
Burnout	23.66 (5.91)	22.38(5.91)	21.91 (6.29)		
STS	18.60 (5.71)	20.20 (5.91)	20.06 (6.01)		
Stress	4.80 (3.76)	8.95 (7.75)	8.49 (8.13)	3.99 (4.24)	<i>p</i> -value: 0.29
Anxiety	2.17 (2.79)	4.54 (6.41)	3.49 (5.57)	1.74 (2.78)	<i>p</i> -value: 0.20
Depression	2.88 (3.83)	5.54 (7.81)	4.86 (7.19)	2.57 (3.86)	<i>p</i> -value: 0.26

^aHegney et al. (2014), *n* = 132.

^bCurrent sample, *n* = 1,369.

^cCrawford et al. (2011) adult sample.

^dComparing current sample means with normative means of DASS21 manual *p* ≤ 0.05; *n* = 497.

their life. However, they did not directly measure resilience in their mixed methods approach. Additionally, these studies did not make direct between-group comparisons of shift vs. non-shift workers.

This study did not find that shift work has significant effect on nurses' intention to remain in the nursing profession, contrary to hypothesis 6. However, nurses working part-time were more likely to remain in nursing for fewer years than full time workers. This finding is inconsistent with those of Estryn-Béhar and Beatrice (2012) who found nurses from 10 European countries who worked part-time (*N* = 25,924) had less work/family conflict, less tiredness, and lower levels of burnout compared with nurses who worked alternating shifts, 10 hr night shifts, 12 hr night shifts, and 10 hr and 12 hr day shifts. In a mixed methods study, Clendon and Walker (2013) reported that nurses working part-time coped better with shift work than nurses working full time. This implies a need for more studies to clearly understand the factors having an impact on psychological functioning and resilience of nurses working shifts.

This study was guided in part by the propositions outlined in the International Collaboration of Workforce Resilience (ICWR-1) model (Rees et al., 2015). The significant relationship between resilience and the psychological outcomes found in this study are consistent with the model. However, the finding that shift work did not have a significant relationship with resilience or any of the measured psychological outcomes (except CS) is surprising. From the perspective of the model, it suggests that working shifts are not a significant workplace stressor having an impact on the resilience and psychological functioning of nurses.

4.1 | Limitations

The large sample size and related statistical power, the use of validated scales and sophisticated analytic techniques, and the relatively representative sample of nurses are strengths of this study. Also, this study is one of the few to have gone beyond the testing of associations between variables among shift workers to specifically investigate between-group (shift vs. non-shifts) differences in psychological outcomes. However, the cross-sectional design of this

study does not allow a clear interpretation of causation and the self-report nature limits the interpretation of the outcomes, with memory and response biases possibly having an impact on data (Barton et al., 1995).

5 | CONCLUSION

This is the first study that has directly measured resilience among nurse shift and non-shift workers. This study overcame some of the methodological issues that affected previous studies and showed that nurse shift workers from a variety of health sectors in Queensland, Australia reported significantly lower levels of CS compared with their non-shift worker counterparts. After controlling for covariates, the results do not support the commonly held belief that shift work affects psychological states of nurses, such as compassion fatigue (STS, burnout), depression, anxiety, stress, and resilience. Furthermore, while part-time workers were more likely to report an intention to leave the profession than did their full time counterparts, there was no difference in intention to leave between nurses who worked shifts and those who did not work shifts. Despite the increasing international concern about attracting and retaining the nursing workforce, this study suggests that shift work may not be a key issue among nurses. However, there is a need for longitudinal studies to confirm the findings.

CONFLICT OF INTEREST

No conflict of interest has been declared by the authors.

AUTHOR CONTRIBUTIONS

MT, JB, LB, RK, DH, CR made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; MT, JB, LB, CR involved in drafting the manuscript or revising it critically for important intellectual content; MT, JB, LB, RK, DH, CR given final approval of the version to be published. Each author

should have participated sufficiently in the work to take public responsibility for appropriate portions of the content; MT, JB, LB, RK, DH, CR agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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