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**Title page****Manuscript category:** Original research**Title:** Psychological capital, wellbeing and patient safety attitudes of nurses and midwives: a cross-sectional survey**Short running title:** Nurses'/midwives' psychological capital**Author information**\*Rosalind ELLIOTT<sup>1,2,3</sup> RN, PhDMargaret FRY<sup>1,3</sup> RN, PhD**\*Corresponding author**Level 7, Kolling Building, Royal North Shore Hospital, St Leonards, NSW 2065, Australia,  
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**ABSTRACT**

Nursing and midwifery are unarguably stressful endeavours requiring high levels of psychological capital and coping strategies. The impact of the work environment on patient safety outcomes suggests that high nurse/midwife stress may be associated with more adverse

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patient events. The purpose of the study was to explore the psychological capital of clinical nurses and midwives and identify explanatory factors (including psychological capital, well-being and health related behaviours) contributing to attitudes to patient safety.

A descriptive web and paper-based survey comprising a convenience sample of nurses and midwives in acute health facilities in Sydney, Australia was performed (October 2018 and April 2019). Variables included: psychological capital; psychological wellbeing; work culture and attitudes to patient safety. Descriptive statistics were performed and a regression model was specified (a statistical significance of  $p < 0.05$  was set a priori).

Psychological capital, depression score and work engagement had a significant effect on patient safety perceptions when controlling for other factors. The findings suggest that nurse and midwife wellbeing is an important consideration when striving to improve patient safety.

**KEYWORDS**

midwife, nurse, patient safety, psychological capital, workplace

## BACKGROUND

Nursing and midwifery are unarguably stressful endeavours requiring high levels of psychological capital and coping strategies. Many factors may be responsible for nurses' tolerance for shift work and tolerance may be improved by higher levels of resilience (Tahghighi, Rees, Brown, Breen, & Hegney, 2017). The effect of some factors such as shift work on stress may not be ameliorated however psychological interventions incorporating mindfulness have been shown to decrease stress and increase resilience (Magtibay, Chesak, Coughlin, & Sood, 2017).

In addition, high nurse/midwife stress may be associated with more adverse patient events such as health care-associated infections (Cimiotti, Aiken, Sloane, & Wu, 2012; Galletta et al., 2016). Suggesting that an enhanced patient safety climate (positive attitudes to patient safety) may be dependent on clinicians' ability to use themselves therapeutically. In other words, have sufficient psychological capital.

The psychological capital, a positive psychological state of hope, efficacy, resilience and optimism, of individuals is widely understood to be a key determinant of work performance, intention to stay, wellbeing and the safety climate (Newman, Ucbasaran, Zhu, & Hirst, 2014). Hope is an ability to persevere with goals successfully and optimism is consciously cultivating a positive attribution to succeed (Luthans & Youssef-Morgan, 2017). Self-efficacy is the knowledge and confidence to carry out specific tasks. Resilience is characterised by the ability to succeed, learn and become stronger in the face of challenges. Individuals may better cope with stress if they have more 'psychological capital' (Luthans & Youssef-Morgan, 2017). Research into the effect of nurses' psychological capital on patient safety and satisfaction is in its infancy.

Low resilience (often a consequence of prolonged stress) has been shown to be negatively associated with burnout symptoms in nurses (Guo et al., 2017) and resilient nurses are less susceptible to psychological distress (Mealer et al., 2012). Furthermore, stress has been associated with increased nurses' and midwives' intention to leave (Perry et al., 2017). Resilience is an important component in maintaining psychological health and may even mediate the effect of individual personality traits associated with poorer psychological function (Hegney, Rees, Eley, Osseiran-Moisson, & Francis, 2015).

There is growing recognition of the role of psychological wellbeing in sustaining the nursing and midwifery workforce (Delgado, Upton, Ranse, Furness, & Foster, 2017; Hegney et al., 2015). Despite the challenges associated with working in contemporary health care reflected in high employment turnover and work dissatisfaction (Perry et al., 2017) many nurses and midwives maintain good psychological functioning and have fulfilling careers (Mills, Woods, Harrison, Chamberlain-Salaun, & Spencer, 2017). However, little is known about the specifics of psychological capital and how nurses and midwives maintain their psychological health and if psychological capital affects attitudes to patient safety.

The aims of the study were to explore the psychological capital of nurses and midwives and to identify explanatory factors associated with nurses' and midwives' attitudes to patient safety including psychological capital, psychological well-being and health related behaviours.

## **METHODS**

### **Ethical considerations**

The study was approved by the LHD Human Research and Ethics Committee (ref no. HREC/17/HAWKE/400). Participation was voluntary (no incentives were offered for participation) and data were unidentifiable. Data were stored electronically (data collected on paper surveys were entered manually) in excel files.

### Sample and data collection

Eligible participants were registered nurses and midwives permanently employed in three health care facilities. Student, casual and agency nurses and midwives and other health employees were excluded. Study invitations were provided via email, in newsletters and flyers distributed at meetings. The data were collected from nurses and midwives working in the tertiary referral hospital and two metropolitan hospitals using either a web or paper-based survey. Paper surveys were distributed to some units at the request of nurse/midwife leaders. These paper surveys were collected in a centrally located sealed box within work units by nurse/midwife leaders and given to one of the researchers. Data were stored electronically (data collected on paper surveys were entered manually by the researcher) in excel files.

The survey contained brief demographic questions including age, gender, facility, ward/unit, speciality and intention to stay working within the LHD. In addition a battery of questionnaires was administered to explore psychological capital (Psychological Capital Questionnaire-24 [PCQ-24]) (Luthans, Avolio, Avey, & Norman, 2007), wellbeing activities (Simple Lifestyle Indicator Questionnaire: [SLIQ] (Godwin et al., 2008)), psychological wellbeing (Depression, Anxiety and Stress Scales-21 [DASS-21] (Lovibond & Lovibond, 1995) and Moral Distress Thermometer [MDT] (Wocial & Weaver, 2013)), work culture (Utrecht Work Engagement Scale [WES] (Wilmar B. Schaufeli, Salanova, González-romá, & Bakker, 2002)) and attitudes to patient safety (Safety Attitudes: Frontline Perspectives [SAQ] (Sexton et al., 2006)).

### Design

A cross-sectional survey of a convenience sample of nurses and midwives working in a Local Health District (LHD), Sydney, New South Wales (NSW) Australia, was performed. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) (von Elm et al., 2007) standardised reporting guidelines were used. The LHD comprised several health care facilities including one tertiary referral hospital which was a State-wide centre for specialities

such as burns, spinal injury and renal treatment. The LHD (one of 15 LHD operating in NSW) served a population of nearly one million people and area covering 900km<sup>2</sup> (Northern Sydney Local Health District, 2017).

### Research questionnaires

**Psychological capital.** The PCQ-24 includes six items (6-point Likert agreement scale) each to assess the four aspects of psychological capital such as, 'I feel confident presenting information to a group of colleagues'. The PCQ-24 component score is the mean of all the items (low = 1 to high = 6). Validity and reliability have all been demonstrated; the internal consistency was high for the component score (Cronbach's alpha: 0.91) and subscales (hope: 0.84, self-efficacy: 0.87, resilience: 0.75 and optimism: 0.79) (Dawkins, Martin, Scott, & Sanderson, 2013). Explanatory notes were added for items 3 and 5 (with permission) to ensure relevance to clinical nurses and midwives). Permission was provided by the developers to use this instrument.

**Life style and wellbeing activity.** The SLIQ comprises 12 health related activity items. Derived global SLIQ scores enable categorisation of a person's health related behaviours ('unhealthy': between 0 and 4, 'intermediate': 5 and 7, and 'healthy': 8 and 10). Subscales scores are 0 to 2 where zero is unhealthy. The SLIQ has good face validity (Godwin et al., 2008) and demonstrated validity when contrasted with other life style measures, such as the Diet History Questionnaire (Pearson's correlation  $r = 0.68$ ) (Godwin, Pike, Bethune, Kirby, & Pike, 2013). Internal consistency was good (Cronbach's alpha, diet: 0.58 and activity: 0.60). The permission of the developers was not required in order to use the SLIQ. In this study respondents were also asked about participation in wellbeing activities such as meditation and mindfulness activities, gratitude activities, activity/step counters and mobile phone wellbeing applications.

**Psychological wellbeing.** The DASS-21 consists of three self-administered 7-item subscales to assess symptoms of depression, anxiety and stress. Scores are doubled to reflect scores for the 42-item DASS corresponding depression, anxiety and stress scale normative cut-off values; 9, 7, 14 (Lovibond & Lovibond, 1995). The DASS-21 has consistently high internal consistency for all scales (Scholten, Velten, Bieda, Zhang, & Margraf, 2017). For this study internal consistency was high; depression: 0.89; anxiety: 0.84 and stress: 0.85. The permission of the developers was not required in order to use the DASS-21.

The MDT is a screening tool used to assess nurses' moral distress working in hospital settings. This single item tool comprises an 11-point scale on which to rate moral distress from 0 (none) to 10 (worst possible) with verbal descriptors. Internal consistency of the MDT is high (coefficient alpha: 0.90) (Wocial & Weaver, 2013). Permission was provided by the developers to use this instrument.

**Work place culture.** The 17-item WES instrument is used to assess work engagement from the perspective of three psychological constructs (scales); vigour (VI), dedication (DE) and absorption (AB). The subscale scores range between 0 (lowest) and 6 (highest). This instrument has high internal consistency (Cronbach's alpha; VI: 0.79, DE: 0.89 and AB: 0.72) (Tsubakita, Shimazaki, Ito, & Kawazoe, 2017). In this study internal consistency was also high (VI: 0.82, DE: 0.87 and AB: 0.74). The total score was an independent variable in the multiple regression analysis (Kulikowski, 2017). Permission was provided by the developers to use this instrument.

**Safety attitudes.** The SAQ 37-item instrument has demonstrated validity for assessment of frontline staff attitudes to patient safety-related climate domains including; teamwork, safety climate, job satisfaction, perception of management, stress recognition, working conditions and collaborative communication. Items are 5-point Likert agreement scales. Higher scores indicate greater agreement and more positive attitudes towards the particular safety domain. It has strong reliability (Raykov's  $\rho = 0.90$ ) (Etchegaray & Thomas,



2012). In this study internal consistency (Cronbach's alpha) for the SAQ domains was  $\geq 0.70$  except for 'collaborative communication' (0.40). Permission was provided by the developers to use the SAQ.

### **Statistical analysis**

Data were analysed using Excel and Stata/IC (ver 13.1rev 16Dec16, StataCorp, Texas,US). Data were cleaned and missing values replaced as recommended by the instrument developers and summarised using descriptive statistics. Multiple ordinary least squares linear regression analysis was performed to explore the independent explanatory factors associated with nurses' and midwives' attitudes to the patient safety climate (SAQ global score). This explanatory model was specified based on background knowledge of factors known and likely to affect attitudes towards patient safety (Heinze, Wallisch, & Dunkler, 2018) and multicollinearity. Multicollinearity was considered unlikely if variance inflation factors were  $< 10$  (Thompson, Kim, Aloe, & Becker, 2017). The fourteen explanatory variables were age, gender, number of years in speciality, clinical speciality, location of workplace in LHD, number of years working in the LHD, total SLIQ score, number of wellbeing activities and scores for total PCQ-24, DASS-21 scales (x3), MDT and WES. The sample size estimation was based on 3,272 permanently employed nurses and midwives, a 3% margin of error and a 95% confidence interval. Thus we anticipated that 780-800 nurses and midwives allowing for 10% absence (leave) (Survey Monkey, 2017) would be required to provide an estimate of the psychological capital of the nursing and midwifery workforce. In practice this was not achieved ( $n = 505$ ); post hoc calculations revealed a 4% margin of error.

### **RESULTS**

Data were collected between October 2018 and April 2019. The response rate was 15% (505 responses from a possible 3,272 nurses and midwives). (Supplementary file 1: Figure 1).

**Demographic characteristics of the sample.** The sample was predominately female with a mean age of 43(standard deviation [SD]: 13) years and a range of between 21 to 73 years. The majority were nurses (n = 464, 92%) (Table 1).

**Psychological capital.** Mean PCQ-24 scores were similar for all four subscales with highest for the resilience subscale, 4.5 (SD: 5.3). The mean component PCQ-24 score was also high (4.3 [SD: 0.5]). (Table 2).

**Life style and wellbeing activity.** Respondents' median SLIQ score was 7.0 (Interquartile range [IQR]: 6.0-8.0) and mean 6.4 (SD: 1.6) suggesting that more than half of the sample practiced an intermediately healthy lifestyle. There were low reports of smoking and alcohol intake. The numbers participating in mediation, mindfulness or gratitude activities and activity/step counters (n = 316) reflected SLIQ findings. More than half (n = 283, 56%) of the sample used mobile phone wellbeing applications. (Supplementary file: Table S1)

**Psychological well-being.** Mean DASS-21 scores were equivalent to expected population cut-off scores for depression, anxiety and stress symptoms (Lovibond & Lovibond, 1995). Moral distress measured using the MDT was low (median 2.0, IQR: 0.0-3.0). Approximately 21% (n =107) respondents rated their moral distress as negligible (zero). (Supplementary file: Table S2)

**Work place culture.** Results for the WES indicated that respondents had high levels of dedication (mean DE: 4.4 [SD:1.1]) and average levels of vigour and absorption. Also overall work engagement mean total WES score: 4.2 [SD: 1.0] (Supplementary file: Table S2).

**Safety attitudes.** Mean SAQ domain and composite scores (70.4 [SD: 13.6]) were high. (Supplementary file: Table S2). More than 42% (n = 165) of the sample had a composite score  $\geq 75$ .

**Factors associated with attitudes to patient safety.** The model explained 23% of the variance in the SAQ score ( $F = 7.64$ , [ $p = 0.0001$ ]); the statistically significant explanatory factors were

DASS-21 depression scale score total WES score and total PCQ-24 score (Table 3). Variance inflation factors were <3.4 (mean 1.8) indicating that multicollinearity was low.

## DISCUSSION

Our study contributes to what is known about psychological capital in the nursing and midwifery workforce. For this large cohort psychological capital was higher than or equivocal to findings of previous reports for population studies (Wernsing, 2014) and health care professionals (Bonner, 2016; Pan, Mao, Zhang, Wang, & Su, 2017). The mean PCQ-24 component score (4.3 [SD: 0.5]) was similar for nurses in the United Kingdom (UK) (Bonner, 2016) but was higher than the mean component 3.5 (SD: 0.4) and subscale scores for a large cohort of nurses in China (Sun, Zhao, Yang, & Fan, 2012). The significance of these findings is as yet unclear as population norms for different work groups are not well established. The PCQ-24 score is likely to be context and work specific.

At least 50% of the cohort appeared to pursue a relatively healthy lifestyle (median SLIQ 7.0 [IQR: 6.0-8.0]). Of note subscales for alcohol and smoking suggested that a small proportion regularly drank alcohol or smoked tobacco. In addition, mobile phone wellbeing application use was high. It is therefore unsurprisingly that psychological wellbeing reflected by DASS-21 scores was good. Our results in this regard differ from more extensive surveys of nurses and midwives in which psychological wellbeing has been reported to be below population norms (Perry et al., 2017). The most likely explanation for this is response bias (that is, more health behaviour orientated nurses and midwives responded to our survey) but it is also possible that the culture of the organisation in which the nurses and midwives in this study worked was conducive to worker wellbeing.

Conversely 50% of our sample appeared to pursue a less healthy lifestyle. Thus, there were areas for improvement especially with regard to diet, life stress and physical activity

subscales. These are aspects of health could be the focus of interventions to further enhance the wellbeing of the nursing and midwifery workforce.

Overall work engagement according to the WES was within the higher range for population norms [3.07 to 4.66] (W. B. Schaufeli & Bakker, 2004) and higher than levels reported by nurses working in acute settings in Japan: mean 2.54 (SD: 0.95) (Kunie, Kawakami, Shimazu, Yonekura, & Miyamoto, 2017). Scores for dedication were highest and scores for vigour exceeded values for nurses in the Netherlands (W. B. Schaufeli & Bakker, 2004). High levels of vigour are associated with low levels of burnout (Van Bogaert et al., 2017). This may in part explain our findings that is low levels of stress and moral distress and high psychological capital.

The percentage of respondents reporting agree/strongly agree (composite score >75) exceeded international benchmarks for healthcare workers in acute care settings for the SAQ (Sexton et al., 2006). This cohort had higher perceptions for all safety attitudes domains compared to nurses (n = 420) surveyed from six hospitals in other areas of Australia (Soh, Morello, Rifat, Brand, & Barker, 2018). In contrast, to our study in which over 60% of the cohort reported positive attitudes to the domains, job satisfaction and teamwork, only 50% of the nurses in that study reported positive attitudes. A potential explanation could be the high proportion of medical and critical care nurse respondents in this study. High SAQ scores have been found in neonatal clinicians (Profit et al., 2012) and health care workers from predominately tertiary referral facilities in China (Zhao et al., 2019). Higher levels of psychological capital and wellbeing along with appropriate work conditions are associated with lower iatrogenic harm (Cimiotti et al., 2012). We did not examine the effect and direction of work conditions (such as nurse to patient ratios) and preferences but it is possible that they contributed to attitudes to patient safety in this study.

Although our explanatory model only explained 23% of the variance in attitudes to patient safety it revealed some important insights about contributing factors. There were three statistically significant explanatory variables in the model; both work engagement and psychological capital were positively associated with patient safety perceptions and DASS-21 depression score was negatively associated with patient safety perceptions. These findings add to a growing area of research examining the relationship between patient safety and nurses' psychological wellbeing. Potentially serious outcomes such as increased iatrogenic infections in relation to emotional exhaustion have been noted (Galletta et al., 2016). Higher perceptions of patient safety have been associated with fewer adverse events (Thomas & Lomas, 2018). Our results support the notion that nurse and midwife wellbeing is instrumental in maximising patient safety. Nurse and midwife wellbeing (particularly diet, stress reduction and physical activity) is an important consideration for policy makers and educationalists striving to improve patient safety; individual and organisational wide wellbeing interventions such as capitalizing on nurses'/midwives' strengths and nurturing their growth (Wei, Roberts, Strickler, & Corbett, 2019) must be included to maintain the health of the workforce.

There are a number of limitations of this study. First a cross-sectional study design precludes any definitive statements about cause and effect. However, many of the instruments were designed to assess respondents' status over time and not at one time point. Second there is always a risk of response bias when performing survey research particularly for a low response rate which was the case for this study. The sample was self-selected so nurses and midwives more orientated than less orientated to a healthy lifestyle may have completed the survey. Although this is a limitation with regards to representativeness and ability to generalise, it provides useful insights into the healthy behaviours and characteristics of resilient nurses and midwives who reported a median duration to remain within the LHD of 10 (5-15) years. Their health related behaviours and high use of wellbeing activities such as

mindfulness and activity/step counters offer ideas about interventions to support the nursing and midwifery workforce and extend longevity of service while also maximising patient safety. Self-report may be confounded by socially desirable responses however the concepts were not amenable to objective testing and this was partially addressed by administering anonymously validated reliable instruments. Third, the regression model was not well specified (that is the variance of 23%). The most likely reason is that we did not collect data for other variables that also affect attitudes to patient safety such as shift work (Tahghighi et al., 2017). Fourthly, although our study comprised a sample from several facilities it was confined to one geographical site which adversely affects the generalizability of the findings.

Further study is warranted to elucidate factors contributing to patient safety attitudes, iatrogenic patient complications and nurses' and midwives' psychological capital. Clinicians may not replenish psychological reserves when using themselves therapeutically while caring for sick people and this may adversely impact patient safety and the culture of care. International multicentre investigations into the feasibility, acceptability and effectiveness of interventions to build psychological capital such as the opportunity for personal and professional growth and clinical supervision in order to improve and maintain patient safety and retain the nursing and midwifery workforce are required.

## **CONCLUSIONS**

This study found high levels of psychological capital, work engagement and psychological and physical wellbeing in a large cohort of nurses and midwives. Both work engagement and psychological capital were positively associated with patient safety perceptions and DASS-21 depression score was negatively associated with patient safety perceptions.

**Author contributions:**

Study design: RE, MF

Data collection: RE

Data analysis: RE

Manuscript writing: RE, MF

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Table 1.

*Demographic characteristics of the sample (n = 505<sup>†</sup>)*

Characteristics	Statistic
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Gender <sup>8</sup> , female, n (%)	454 (90)
Age <sup>16</sup> , years, mean (SD <sup>‡</sup> )	43 (13)
Specialty experience <sup>6</sup> , years, median (IQR)	8 (3-17)
Duration working at LHD <sup>55</sup> , years, median (IQR)	8 (3-16)
Intention to stay at LHD <sup>69</sup> , years, median (IQR)	10 (5-15)
Profession <sup>5</sup> , n (%)	
Nurse	464 (91)
Midwife	21 (5)
Working in both nurse and midwife roles	15 (3)
Type of role <sup>13</sup> , n (%)	
Clinical	422 (84)
Management	31 (6)
Education	18 (4)
Administration	6 (1)
Other	15 (3)
Nursing specialty <sup>5</sup> , n (%)	
Medical	111 (22)

Critical care	98 (20)
Surgical	86 (17)
Child and family health	44 (9)
Primary health care	35 (7)
Mental health	19 (4)
Other (too many categories to separate)	107 (21)
Type of facility <sup>7</sup> , n (%)	
Tertiary referral hospital	305 (61)
Metropolitan hospital 1	121 (24)
Metropolitan hospital 2	64 (13)
Other (LHD governance)	8 (1)

<sup>†</sup>>5 missing data for some variables (shown in superscript above variable); <sup>‡</sup>SD = standard deviation; <sup>§</sup>LHD = local health district

Table 2

*Psychological Capital-24 (PCQ-24) subscale and total score: descriptive statistics (n = 456)*

	Mean (SD)
Hope	4.3 (0.7)
Self-efficacy	4.4 (0.8)

Resilience	4.5 (0.6)
Optimism	4.3 (0.7)
Total score	4.3 (0.5)

Notes: SD = standard deviation, PCQ-24 score range: 1 (low) to 6 (high)

Table 3

*Explanatory factors contributing to nurses' and midwives' attitudes to patient safety*

Explanatory variable	Coefficient	Standardised Beta	SE	95% Confidence levels
Age, years	-0.11	-0.11	0.07	-0.287– 0.030
Gender, female vs male, prefer not to say (dummy)	-4.02	-0.07	2.43	-8.800– 0.759
Duration working in speciality area, years	0.11	0.08	0.10	-0.066 – 0.316
Medical, critical care and surgical vs all others (dummy)	1.80	0.05	1.49	-1.123-4.730
LHD tertiary referral hospital vs other facilities (dummy)	0.35	0.01	1.41	-2.437 – 3.162
Time at LHD, years	-0.08	-0.05	0.11	-0.304 – 0.119
Total SLIQ score	-0.04	-0.01	0.48	-0.975 – 0.899
Self-care activities, number	-0.55	-0.04	0.71	-1.972 – 0.875



DASS-21 depression scale score	-0.37*	-0.20	0.14	-0.666 - -0.095
DASS-21 anxiety scale score	-0.06	-0.02	0.16	-0.370 – 0.254
DASS-21 stress scale score	0.23	0.11	0.16	-0.094 -0.577
MDT score	-0.59	-0.09	0.37	-1.337 – 0.162
Total WES score	3.93**	0.24	0.93	2.101 – 5.753
Total PCQ-24 score	0.15***	0.16	0.05	0.028 – 0.266

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*Note:* Ordinary linear regression analysis: dependent variable = total SAQ score,  $F(p) = 7.13$  ( $p=0.0001$ ),  $R^2 = 0.229$  (23%); adjusted  $R^2 = 0.196$  (23%); constant 48.94, \*  $p = 0.009$ , \*\*  $p = 0.001$ , \*\*\*  $p = 0.016$ ,  $SE$  = Standard error, LHD = local health district, SLIQ = simple lifestyle indicator questionnaire, DASS = depression, anxiety and stress scales, MDT = moral distress thermometer, WES = Work Engagement Scale, PCQ = psychological capital questionnaire.