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Health, workforce characteristics, quality of life and intention to leave: The ‘Fit for the Future’ survey of Australian nurses and midwives

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ABSTRACT

Aim:

To examine the quality of life of nurses and midwives in New South Wales, Australia and compare values with those of the Australian general population; to determine the influence of workforce, health and work life characteristics on quality of life and its effect on workforce intention to leave.

Background:

Few studies have examined nurses' and midwives' quality of life and little is known of its effects on workforce longevity.

Design:

This was a cross-sectional survey conducted in 2014-2015.

Methods:

The 'Fit for the Future' electronic survey, delivered to nurses and midwives, examined demographic, work and health-related factors, which were compared with Australian general population normative values for physical and mental components of quality of life (the Short Form-12). Univariate and multivariate logistic regression models assessed associations with workforce intention to leave.

Results:

Physical and mental component scores, calculated for 4,592 nurses and midwives, revealed significantly higher physical but lower mental component scores than the general population. Physical component scores decreased with increasing age; higher scores were seen in nurses with better health indices and behaviours. Mental wellbeing scores increased with increasing

age; in nurses who reported job satisfaction, no work injury, sleep problems or frequent pain and non-smokers. The odds of intention to leave decreased with increasing mental wellbeing.

Conclusion:

Managers and decision-makers should heed study recommendations to implement health promotion strategies for nurses and midwives, aiming to improve mental health, specifically, to promote workforce retention.

Key words:

Nurses, midwives, workforce, quality of life, health, mental health, physical health, intention to leave, retention

SUMMARY STATEMENT

Why is this research needed?

- Quality of life is an important index of the general wellbeing of a population or an individual.
- Nurses and midwives are the one of the largest workforces in the world, but studies of their quality of life are few and little is known about the association between quality of life and workforce retention/ intention to leave for nurses and midwives
- Identification of predictive factors that might be amenable to change opens the possibility to develop interventions to enhance quality of life and promote workforce retention of nurses and midwives.

What are the key findings?

- These Australian nurses and midwives had significantly better physical but significantly lower mental quality of life than the Australian general population.
- Age, daily smoking, mood and sleep disorders and pain frequency were strongly linked with both physical and mental quality of life for nurses and midwives.
- Mental components of quality of life were strongly associated with reduced intention to leave the workforce.

How should the findings to be used to influence policy?

- Targeted strategies should be developed for the nursing and midwifery workforce which include quality of life improvement.

- Targeted intervention strategies should be implemented in mental health promotion for nurses and midwives to reduce intention to leave the workforce.

INTRODUCTION

The definition of quality of life (QoL) is much debated, but there is broad support for the WHO (1996) statement that it encompasses a person's perceived goals, standards and concerns, in relation to their cultural context (Whoqol-Bref 2003). QoL was dubbed the 'missing measurement' in health research by Fallowfield (1990), despite QoL being rated in importance on a par with mortality and morbidity as a health outcome. Measures of QoL are now widely valued as subjective summary measures of holistic wellbeing from multiple core aspects of an individual's life (National Center for Chronic Disease Prevention and Health Promotion 2016). For those who are members of a workforce, work life contributes substantially to QoL, especially for full time workers; moreover, QoL in general has potential to have an impact on workforce outcomes (Sarafis et al. 2016). Numerous studies have explored links between job satisfaction and intention to leave (Blaauw et al. 2013, Masum et al. 2016) and associations between quality of work life (commonly considered a subset of quality of life) and intention to leave (Lee et al. 2013b, Lee et al. 2015), but this has been little examined amongst nurses and midwives - the largest professional group of the health workforce and one of the largest workforces in the world. Hence, we sought to examine the QoL of nurses and midwives in Australia and to contextualise this through comparison with the QoL of the Australian general population; to determine the influence of workforce, health and work life characteristics on quality of life and its effect on workforce intention to leave. The ultimate purpose of this study was to identify predictive factors that might be amenable to change to inform development of interventions to enhance wellbeing and promote workforce retention of nurses and midwives.

Background

Quality of life (QoL) is an important dimension of the health of a population or an individual. How a person feels about their job relates to their individual goals and expectations and hence to their overall QoL. Previous studies have demonstrated the influence on QoL of features such as health, work life and various work-related factors. Workplace violence, bullying and harassment, workplace stress and burnout (Budin et al. 2013) are well-recognised as work life factors that influence and impair QoL (Chen and Huang 2014, Zeng et al. 2013) even after controlling for other factors (Wu et al. 2014). Verbal abuse from colleagues, bullying and sexual harassment all led to decreased job satisfaction in samples of American nurses, Finnish physicians and American and Pakistani women (Budin et al. 2013, Heponiemi et al. 2014, Melnyk et al. 2013) and QoL was significantly lower in Taiwanese college students who had experienced bullying than those who had not (Chen and Huang 2014). Occupational burnout, a particular form of psychological job stress often involving doubts about competence or the value of the work role (Mayo Clinic 2012), has been shown to exert a direct negative effect on QoL (Arandjelovic et al. 2010, Yao et al. 2014) and job satisfaction (Piko 2006, Xiao et al. 2014). Work context can also contribute to QoL, with a study of Taiwanese nurses demonstrating QoL differing by work department. Nurses working in wards and emergency or intensive care units (usually involving shift work, direct patient care and high time pressure) reported lower QoL (Chiu et al. 2007). Quality of work life as a whole has been strongly associated with nurses' intention to leave, with lower quality of work life related to greater intention to leave (Lee et al. 2013b, Lee et al. 2015, Almalki et al. 2012). However, the relationship between quality of life and intention to leave nursing or midwifery remain uncertain.

Psychosocial work factors such as skill level, job strain, work-life balance, psychological job demand, decision latitude, decision authority and job control can also influence QoL.

Psychosocial work factors as a whole affected the QoL of male Malaysian automotive factory workers (Edimansyah et al. 2007); other studies linked QoL with specific aspects, such as job strain (Lerner et al. 1994, Tzeng et al. 2013), job control (Liang et al. 2014), social support (Jönsson 2012, Liang et al. 2014, Tzeng et al. 2013), work-life imbalance (Makabe et al. 2015), occupational stress and role overload (Wu et al. 2011) and imbalanced effort/reward (Teles et al. 2014). However, promotion of work ability can benefit QoL in physical, psychosocial, social relationship and environmental domains (Milosevic et al. 2011, Sörensen et al. 2008) and positive correlations between QoL domains and job satisfactions have also been revealed (Cimete et al. 2003, Ibrahim et al. 2016).

An individual's health has been significantly associated with their QoL. Chronic, non-cancer and musculoskeletal pain have all been significantly linked with poorer QoL (Garrido et al. 2015, Inoue et al. 2015, Lapane et al. 2015, Paananen et al. 2011) and QoL was reduced in a sample of people with Type 2 Diabetes Mellitus compared with a control group (Vidal-Peracho et al. 2014). However, links may not always be simple: while increased weight led to poorer health, it was not found to affect QoL in a Canadian sample (Thommasen et al. 2005). Ageing effects are also potential contributors and are likely to have an increasing impact with the ageing of the Australian nursing and midwifery workforce; 47% are now aged 50 years and older (Nursing and Midwifery Board of Australia. 2016).

With the ageing of the nursing workforce and the imminent retirement of the large 'Baby Boomer' generation, current and predicted nursing shortages are focusing attention on the importance of supporting and retaining those currently in post. Studies of work life-related factors have demonstrated potential to influence QoL, but few studies have focused on nurses. Studies have examined the associations between nurses' job satisfaction and intention to leave and between quality of work life and intention to leave, but the influence of QoL in relation to nurses' future job intentions remains largely unknown. However,

nurses' health and QoL may affect the ability of some workers to meet work demands, particularly those more advanced in years and may be influential in workforce retention. Findings reported in this paper derived from the 'Fit for the Future' study, a project conceptually rooted in the ethos of the Health Promoting Hospitals movement. The aims of this approach include addressing the health of staff, by evaluating and compiling evidence on health promotion activities in the health care setting and incorporating health promotion into hospital quality and management systems (World Health Organization, 2017). The study purpose aligns with this by aiming to identify factors predictive of nurses' QoL that might be amenable to health promotion intervention to enhance nurses' QoL, general wellbeing and workforce retention.

THE STUDY

Aims

The aims of this study were:

- 1) to examine the quality of life of nurses and midwives in New South Wales, Australia. To contextualise these findings, values were compared with those of the Australian general population
- 2) to determine the influence of health and work life characteristics on quality of life and its effect on workforce retention.

Design

Cross-sectional survey design was employed to collect data on nurses' and midwives' QoL and potentially linked factors, including demographic, work-related and health-related factors, as set out below.

Participants

A web-based survey launched as part of the 'Fit for Future' study (Perry et al. 2016) between June 2014 - February 2015 was delivered as a link in an email to the membership of the NSW Nurses and Midwives Association (the nursing and midwifery professional and industrial organisation of NSW). The survey was advertised in the Association journal. The link was also snowballed through professional contacts in the nursing and midwifery workforce of NSW, Australia. Of the total 5,446 responses, 405 (7.4%) were excluded due to missing data or because respondents were non-practicing.

Data collection

The electronic survey sought a wide range of occupational and health-related details, including demographic, workforce, general health and well-being characteristics. Well-established tools were employed, selected or adapted from long-running, extensively validated national and international surveys, such as Nurses and Midwives e-Cohort Study, the Australian Longitudinal Study on Women's Health and the Australian Health Survey. Full details of the 'Fit for the Future' survey instrument and study methods have been reported (Perry et al. 2016) .

The Short Form-12 version 2 (SF-12v2) (Sanderson and Andrews 2002) was used to collect QoL data. This instrument addresses the same eight domains as the SF-36: physical functioning, role-physical, bodily pain, general health perceptions, vitality, social functioning, role-emotional and mental health. Two composite scores are obtained, representing physical and mental component summaries (i.e. Physical Component Summary: PCS; Mental Component Summary: MCS). For all QoL measures, the higher the score, the better the

(mental or physical) QoL component. To examine the factors associated with QoL for nurses and midwives, potential predictive variables included: 1) demographic factors: age, gender and education level; 2) work-related factors: work setting, work roles, work locations, working hours, contract and roster status, sick days, work injury/abuse and job satisfaction; 3) health-related factors: admission to hospital, disease diagnoses and symptoms, prescribed medication use, mood and sleep disorders, pain intensity and frequency, Body Mass Index (BMI) and smoking status.

Demographic and work-related factors

Responses to items describing educational level were recoded as entry level (certificate, diploma, bachelor degree) or postgraduate qualification (postgraduate certificate/diploma, master's degree or PhD). Data on whether or not nurses and midwives provided regular care, help or assistance to family members or others because of disability, long term illness or age-related problems were collected.

Participants' current worksite settings were classified as: (1) hospital; (2) residential aged care/ rehabilitation or disability; (3) community health centre, general practice, outpatient/ambulatory care); and (4) others. Current primary work roles were classified as: (1) Assistants in Nursing (AINs); (2) foundational nurses (front-line clinical staff); (3) domain specific (educators/ managers/ researchers); and (4) advanced practice and practitioner nurses and midwives (with an extended scope of practice). Work location was defined as metropolitan, inner regional and outer regional areas (include rural, remote and very remote areas) (Perry et al. 2016). Work contract was classified as full-time or part-time (including casual and agency) working. The roster worked was defined as work performed exclusively in 'office' hours versus including time outside 'office' hours (including evening, rotating and

night shifts or a combination of these). Sick days and work injuries/abuse were recoded as 'none' or 'at least one' occasion in the past 12 months. Job satisfaction responses were collapsed into two categories ('neither agree nor disagree, disagree and strongly disagree' versus 'agree or strongly agree'). Intention to leave was coded as 'no plans within the next year' or 'within the next year'.

Health-related factors

Chronic disease diagnosis was recoded based on the number of disease diagnoses reported: none versus one, two or three and more diagnoses. Mental health problems (anxiety, depression or any other form of psychiatric illness) were recoded as 'any' versus 'none'. Prescribed medication use was coded as 'none' versus 'at least one'. Admission to hospital was recoded as 'none' or 'at least one occasion' in the past 12 months. Sleep was classified in five categories: no problem, mild, moderate, severe and very severe problems based on the summed scores of the Insomnia Severity Index (Morin et al. 2011). Frequency of pain was recoded as 'never/ rarely' or 'sometimes/ often' in the past four weeks. Pain intensity was recoded as 'none/very mild/mild' or 'moderate/severe/very severe' in the past four weeks. BMI status was calculated based on self-reported height and weight, categorised in line with the WHO classifications (World Health Organisation 2006) and recoded as 'under/ normal weight' or 'overweight/ obese'. Smoking status was recoded as 'daily smoker' or 'not daily smoker'. Physical activity was calculated from time spent doing each of walking briskly, moderate and vigorous leisure activity in the previous week and coded as 'meeting' or 'not meeting' the guideline based on Australian recommendations (Australian Institute of Health and Welfare 2016). QoL scores were calculated using the QualMetrics algorithm as PCS and MCS.

Ethical considerations

The study was approved by the UTS Human Research Ethics Committee (LNR11/POWH/242; LR/2013000741) and South Eastern Sydney Local Health District (SESLHD) Human Research Ethics Committee (LR/2013000741).

Data analyses

Data were entered into the Statistical/data Package STATA/SE 13.1 (STATA; StataCorp) for cleaning and analysis. Two tailed t-tests were used to examine the data for significant differences in the mean QoL scores between NSW nurses and midwives and South Australian population normative values (as these were the most complete SF-12 data available for the Australian population) (Avery et al. 2004). ANOVA was used to examine the association between age and eight SF-12 domains, respectively. Univariate and multivariate linear regression models were used to examine the association between potentially predictive factors and QoL for nurses and midwives, using a stepwise approach. Univariate and multivariate logistic regression models were used to examine the association between QoL and intention to leave. Inclusion of variables in the multivariate model depended on univariate significance ($p < 0.05$ for inclusion). A 5% level of significance was accepted.

Validity, reliability and rigour

The electronic survey comprised validated and reliable questions and instruments. Details of the validity and reliability of the elements comprising the survey instrument have been reported (Perry et al. 2016). Cronbach alpha values of 0.85 and 0.86 were reported for these PCS and MCS, respectively.

RESULTS

Nursing and midwifery participants

Complete data were available to calculate SF-12v2 Physical and Mental Component Summaries (PCS and MCS, respectively) for 4,592 (91.1%) survey respondents; Table 1 shows the participants' characteristics. Respondents' mean age was 48 (SD 11.5) years and 65.8% were aged 45 years and older. These participants were well-educated; 54.9% were graduates and 44.8% had postgraduate qualifications. Most (90.7%) were female, worked full-time (53.8%) and shift work (52.5%) including night shifts. Almost three quarters of participants (71.5%) were employed in foundational roles (Registered Nurse/ Clinical Nurse Specialist grades); the majority were metropolitan (66.5%) and hospital-based (59.7%). Their average working week was 34 hours, but 40% reported working more than 40 hours in an average week. There were no significant differences in the demographic profiles of SF-12v2 responders and non-responders.

Quality of life scores

Table 2 shows participants' quality of life scores (PCS and MCS). Overall, these nurses reported an average mean (SD) SF-12 physical component score of 51.7 (8.1) and mental component score of 48.6 (9.6). Males had on average higher PCS and MCS than females (53.5 vs 51.5 for PCS; 48.7 vs 47.6 for MCS). People in the younger age group (aged 18-44 years) had higher PCS, while people in the older age group (aged 45 years and older) had higher MCS.

We compared our QoL data with available Australian data, drawn from a South Australian (SA) normative population SF-12 dataset (Avery et al. 2004) (Table 2). Nurses and midwives in NSW had significantly higher PCS than the SA general population ($p < 0.001$), but significantly lower MCS ($p < 0.001$). This pattern of significant difference between nurses and midwives in NSW and the SA general population for both PCS and MCS was reflected for both genders and for all age groups except those aged 18-24 years for PCS and 65 years+ for MCS ($p > 0.05$).

The average scores for the eight SF-12 domains for nurses and midwives in NSW by age bands are shown in Table 3. Nurses and midwives in the younger age group had better physical functioning and suffered less bodily pain than older age groups ($p \leq 0.001$). However, older nurses and midwives had higher scores in terms of role emotional, social function, mental health, vitality and general health ($p < 0.03$).

Associations between predictive variables and PCS

As the literature demonstrated that both health and work-related factors have potential to influence QoL, we used multivariate linear regression models that included demographic, work-related and health-related variables for the SF-12 physical and mental component dependent variable scores, separately. Table 4 shows the multivariate models of association between the predictive variables and PCS and MCS, separately.

Table 4a shows statistically significant associations ($p < 0.05$) with PCS according to: age, work roles, sick days and admission to hospital, BMI, smoking status, physical activity levels and sleep disorder, chronic disease diagnosis and prescribed medication use.

PCS reduced significantly with increasing age. Compared with foundational nurses, those whose work role was advanced practice or domain specific had a greater PCS, while those

whose work role was AIN had significantly lower PCS. Compared with nurses taking no sick days, those taking sick days had significantly lower PCS. Nurses with no hospital admissions within the last year had significantly higher PCS than those who had hospital admissions. Compared with nurses who were under/normal weight, nurses who were overweight/ obese had significantly lower PCS. Nurses who smoked daily had significantly lower PCS than those who did not smoke. Nurses meeting physical activity guidelines had significantly higher PCS than those who did not meet these guidelines.

Nurses with disordered sleep had significantly lower PCS than those who did not suffer from sleep disorder. Nurses with no chronic disease diagnoses had significantly higher PCS than those with at least one disease diagnosis. Compared with nurses who did not use prescribed medications, nurses who used prescribed medicine had significantly lower PCS.

No statistically significant differences were found in PCS by gender, education levels, work settings, work contract, roster, work injury or job satisfaction. Mood disorder was a confounded variable for PCS; as we were unable to eliminate the confounded effect it was removed from the model.

Associations between predictive variables and MCS

Table 4b shows statistically significant associations ($p < 0.01$), with higher MCS scores accruing in line with: increasing age, job satisfaction, informal care-giver status, no rather than any work injury or sleep disorder and lesser pain frequency; not daily smoking.

Compared with nurses unsatisfied with their jobs, those with job satisfaction had significantly higher MCS. Compared with nurses who did not provide family care assistance, nurses who were family carers had significantly lower MCS. Compared with nurses who had not experienced work injury/abuse, nurses with this experience had significantly lower MCS.

Compared with nurses who did not smoke, nurses who smoked daily had significantly lower MCS. Compared with nurses who did not suffer pain, nurses with pain had significantly lower MCS.

Interactions occurred between shift work and sleep disorder. Compared with nurses and midwives who worked office hours and had no sleep disorder, those who worked night shifts and had severe sleep disorder had lower scores. No statistically significant differences were found between MCS and gender, work setting, work locations, work contract, sick days, admission to hospital, disease diagnosis, prescribed medication use, pain intensity or BMI (Table 4b).

Associations between QoL and intention to leave

Table 5 shows the associations between QoL and nurses' and midwives' intention to leave their jobs. With 1,013 (22.1%) nurses and midwives expressing their intention to leave within the next year, after adjusting for demographic, work-related and health-related factors, statistically significant differences were found between MCS scores in relation to expressed intention to leave (Table 5b, model c). The odds of intention to leave decreased by 2% with each one score increase in MCS ($p=0.005$). No statistically significant difference was found between PCS and intention to leave ($p>0.05$; Table 5a).

DISCUSSION

In summary, this study found male nurses and midwives with higher physical (PCS) and mental (MCS) QoL scores than females; those younger had better physical functioning and less bodily pain than older age groups, who scored higher scores in terms of mental

components. Nurses had significantly higher PCS but significantly lower MCS than the general population, for both genders and age groups except those 18-24 years (PCS) and 65 years+ (MCS).

PCS scores were predicted to decrease with increasing age; higher scores were seen in advanced practice and domain specific nurses, in nurses not reporting sickness absence or hospital admissions, at normal/ underweight BMI, not daily smoking, meeting physical activity recommendations, without sleep problems, chronic disease diagnoses or using prescribed medications. MCS scores were predicted to increase with increasing age; in nurses who reported job satisfaction, who were informal carers; who did not report work injury, sleep problems or frequent pain and were not daily smokers. The odds of intention to leave decreased with increasing MCS.

Findings of younger people with better physical but lower mental QoL than older age groups are consistent with some other studies (Smee et al. 2012, Australian Bureau of Statistics. 2007). However, whilst Australian data revealed the same pattern for PCS, MCS Australian population data remained consistent across ages (Avery et al. 2004). Study findings showing males with better QoL than females are consistent with Australian data (Avery et al. 2004). Study findings revealed nurses and midwives had higher physical but lower mental component QoL scores. This picture was consistent with that from the Household, Income and Labour Dynamics in Australia Survey, an Australian nationally representative sample of 9,771 Australians aged 21 or older, which reported mean PCS of 50.6 and MCS of 49.5 from the SF-36 (Renzaho et al. 2010). Our study produced a sample with a profile broadly representative of the Australian nursing and midwifery workforce (Perry et al. 2016); as a consequence, results indicating that nurses and midwives have better physical health functioning and general health status but worse mental health status (particularly at younger ages) than the Australian population have implications for the Australian nursing and

midwifery workforce, their managers and policy-makers and for the wider Australian community.

Nurses and midwives could be expected to have better knowledge and skills in keeping physically healthy than the general population, which may go some way to explain their higher physical component scores. It may also be attributed, at least in part, to the regular physical exertion of these occupations, at least for the around 70% of respondents in foundational ('front line') roles, albeit this was not the group of nurses scoring highest for PCS scores. However, compared with the general population, nurses and midwives had worse MCS. These occupations and particularly nursing, have long been recognised as stressful, entailing daily exposure to human suffering, frequent violence, long working hours, staffing challenges and the interpersonal relationships that are central to the work (Barton 2009). There has been much discussion and some localised interventions aimed to improve nurses' and midwives' mental health, such as using stress management and mindfulness-based stress reduction programs (Edwards and Burnard 2003, Yazdani et al. 2011, Ruotsalainen et al. 2008). However, there are no consistent research findings on which to base mental health promotion for the nursing and midwifery workforce. In light of these findings, this is an important omission and future consideration.

Of the predictive demographic factors, age was associated with physical QoL. Increasing age was closely linked to reducing PCS, including decreased physical function and greater bodily pain. Functional limitation is perhaps likely to increase with decreasing physical capacity and capability alongside the ageing of an occupation that entails a high level of physical labour. However, decreasing physical function may also be linked with increasing prevalence of diseases and symptoms, both accumulating with age (Manini 2011, Australian Institute of Health and Welfare 2007). Perhaps unsurprisingly, better physical QoL was seen in nurses reporting better performance of health risk behaviours (not smoking/ overweight or obese;

meeting physical activity recommendations) and better health (no sleep problems, sickness absence or hospital admissions, chronic diseases or prescribed medication use), although of course the direction of these relationships cannot be determined: PCS could equally be a cause or result of, for example, overweight/obesity. These associations were consistent with previous studies showing health-related issues as key factors for the overall experience of wellbeing and QoL (Zubaran et al., 2008, Garrido et al., 2015, Inoue et al., 2015, Lapane et al., 2015). Absence of disease has been positively associated with QoL in the general population (Zubaran et al. 2008, Garrido et al. 2015, Inoue et al. 2015, Lapane et al. 2015). Multiple Australian studies show that people suffering pain and attending chronic pain clinics report reduced QoL; pain management interventions have improved QoL amongst various patient groups (Agboola et al. 2015, Huang et al. 2013). High rates of pain, particularly musculo-skeletal pain, have been reported amongst nurses in other studies worldwide (Lee et al. 2013a, Munabi et al. 2014, Freimann et al. 2013); however, preventive and pain management studies among nurses are few.

Links between sleep problems and QoL have been reported across the NSW population (N=63,408 adults) (Magee et al. 2011). Sleep difficulties, daytime dysfunction, sleepiness and irritability are prevalent, affecting 20%-35% of the Australian population; the importance of adequate sleep and sleep quality for physical and mental health has been clearly demonstrated (Szentkirályi et al. 2009, Hillman and Lack 2013). Considering their substantial rates of shift-working and the links shown in this study between night shift-working, disordered sleep and poorer QoL, sleep hygiene training might be beneficial for nurses and midwives.

Goldenberg et al (2014) showed higher odds of smoking initiation and lower odds of successful smoking cessation associated with poorer QoL (Goldenberg et al. 2014, Heikkinen et al. 2008). Cahill and Lancaster (Cahill and Lancaster 2014) concluded that telephone

counselling and supporting services can effectively increase smoking cessation rates in workplaces. These sorts of effective interventions (Zhu et al. 2002, Borland et al. 2001) may be suitable for delivery to the nursing and midwifery workforce for smoking control and hence improving their QoL, offering potential for the future, that health promotion for disease risk reduction may also enhance physical QoL. However, further work is needed to examine their efficacy in workplaces.

Better mental QoL scores were seen in nurses who were informal carers. Informal caregiving is often described as stressful, particularly for older women in what can be described as the ‘sandwich generation’: still caring for their own (often teen/ early adult) children whilst simultaneously taking on responsibility for frail older family members (Schulz et al. 2008). However, the rewards of caregiving are also described, entailing a sense of satisfaction and self-worth (Gordon et al. 1993). Recent population-based studies also show caregivers with lower mortality, extended longevity and better health outcomes (Roth et al. 2015).

Of the work-related factors, job satisfaction and intention to leave were significantly associated with QoL. Nurses and midwives who were satisfied with their jobs had mental component scores 4.7 points higher than those who were not satisfied. Higher MCS predicted lower intention to leave, consistent with a study among employees (50% clinical staff) in nursing homes in the US (Zhang et al. 2014). This finding has important implications for nursing and midwifery managers and policy-makers, as well as the Australian community generally. However, the relationship between job satisfaction and QoL has not been shown to be consistent across population groups in previous studies. Positive correlations between job satisfaction and QoL were found for nurses in Istanbul (Cimete et al. 2003), but not for Taiwanese or Greek nurses (Cheng and Huang 2014, Ioannou et al. 2015). Perhaps these different patterns of association may be due to cultural perspectives on work and work-life balance. Poorer physical health has been shown to increase the likelihood of people leaving

the workforce (de Oliveira et al. 2017), but this association between PCS and intention to leave was not seen in this study. Further work is required to identify characteristics which mediate or moderate these relationships.

Higher PCS scores were seen in advanced practice and domain specific nurses, compared with AINs and foundational nurses. This may be linked to the greater physical demands of AIN and foundational roles. Study findings failed to identify any significant association between workplace location (metropolitan/non-metropolitan) and QoL for nurses and midwives. Although there is some indication this may be significant (Schalock et al. 2005), few studies have explored this, indicating the need for further research.

Limitations:

Limitations of this study include its cross-sectional design which prevents conclusions about the aetiological link between predictive factors and QoL. The tools of the questionnaire were also limited in their inability to address the multiple factors that lead to challenge in work conditions. Domain-level SF-12 data could not be compared with Australian general population data across all age groups as the survey instruments differed (SF-12 versus SF-36). Self-reported intention to leave was assumed to be a valid representation of future occupational exit, as this has been demonstrated to hold true in other nursing workforce studies (Lagerlund et al. 2015, Eley et al. 2010). Associations between job satisfaction and QoL not consistent with previous studies may be due to the cultural and/or gender-determined nature of QoL. Response bias is possible as respondents may have been those who were more aware of QoL-related factors measured for this survey.

CONCLUSION

This study fills a gap in knowledge by exploring QoL and identifying health and work characteristics predictive of this for nurses and midwives in Australia. Identification of factors potentially amenable to change is the first important step towards developing interventions to improve nurses' QoL, general wellbeing and workforce retention. These findings flag strong associations between QoL, health, health risk behaviours and work factors, as well as intention to leave.

The study provides evidence for nursing/midwifery managers, researchers, decision-makers and policy makers and advocates for the development and implementation of targeted interventions for the nursing and midwifery workforce. Findings indicate potential benefit in terms of staff QoL and workforce retention, for interventions focused on mental health, wellbeing, coping and resilience particularly, but also on better sleep, pain reduction, smoking cessation and general health screening/ health promotion. Interventions to address these components can be developed and trialled, complemented by qualitative research to understand what promotes and deters uptake and adoption of interventions. With growing alarm over increasing mental health-related problems and their effects in relation to job satisfaction and the QoL of nurses and midwives, particularly those younger-aged with many working years still ahead of them, health professionals should heed study recommendations to take steps to address factors exerting negative effects on the work life, QoL and the workforce longevity of nurses and midwives. Study findings can be used to improve and safeguard the health and well-being of this essential workforce and therefore by extension, the Australian community.

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Table 1. Characteristics of study participants (N=4,592)

Factors	N (%)
Age	
Mean (SD)	48 (11.5)
Education levels	
Entry level qualification only	2,459 (55.2%)
Postgraduate qualification	1,998 (44.8%)
Gender	
Female	4,157 (90.7%)
Male	427 (9.3%)
Contract	
Full-time	2466 (53.8%)
Part-time/casual/pool	2114 (46.2%)
Roster	
Day work	2181 (47.5%)
Shift work	2410 (52.5%)
Work role	
AIN*	204 (4.5%)
Foundational	3241 (71.5%)
Domain specific	730 (16.1%)
Advanced practice	360 (7.9%)
Work location	
Metro	3019 (66.5%)
Inner regional	1235 (27.2%)
Outer regional/rural/remote	287 (6.3%)
Work setting	
Aged care/rehab/disability	607 (13.2%)
Hospital	2743 (59.7%)
Primary care/community/ outpatient	831 (18.1%)
Others	411 (9.0%)
Working hours	
<40 hours	2717 (60.0%)
≥40 hours	1812 (40.0%)

*AIN: Assistant in Nursing

Table 2. SF-12v2 Physical Component Scores (PCS) and Mental Component Scores (MCS) across gender and age groups of NSW nurses and midwives and a South Australian population normative group

Variables	NSW nurses and midwives		South Australian population*		P value**
	N	Mean (95% CI)	N	Mean (95% CI)	
		Physical component scores			
	4,592	51.7 (51.4 - 51.9)	2013	48.9 (48.6 - 49.4)	<0.001
Gender					
Male	427	53.5 (52.8 – 54.2)	979	49.7 (49.1 – 50.3)	<0.001
Female	4,157	51.5 (4102 – 51.7)	1034	48.4 (47.7 – 49.0)	<0.001
Age					
18-24	143	53.3 (52.2 - 54.5)	237	53.3 (52.5 - 53.9)	1.00
25-34	575	53.4 (52.8 - 54.0)	360	52.5 (51.8 - 53.2)	0.049
35-44	807	53.0 (52.5 - 53.5)	403	51.3 (50.5 - 52.2)	<0.01
45-54	1,395	51.7 (51.3 - 52.1)	373	49.2 (48.2 - 50.2)	<0.001
55-64	1,376	50.2 (49.8 - 50.7)	257	46.7 (45.4 - 48.0)	<0.001
65+	152	49.1 (47.7 - 50.5)	383	41.9 (40.2 - 43.7)	<0.001
		Mental component scores			
	4,592	48.6 (48.4; 48.9)	2013	52.4 (52.0 - 52.8)	<0.001
Gender					
Male	427	48.7 (47.8 – 49.6)	979	53.4 (52.9 – 53.9)	<0.001
Female	4157	47.6 (47.3 – 47.9)	1034	51.4 (50.8 – 52.0)	<0.001
Age					
18-24	143	45.1 (43.4; 46.7)	237	51.6 (50.5 - 52.7)	<0.001
25-34	575	45.5 (44.7; 46.4)	360	52.5 (51.6 - 53.3)	<0.001
35-44	807	46.9 (46.3; 49.3)	403	51.7 (50.9 - 52.6)	<0.001
45-54	1,395	48.8 (48.3; 49.3)	373	51.5 (50.5 - 52.5)	<0.001
55-64	1,376	50.7 (50.3; 51.2)	257	53.4 (52.4 - 54.5)	<0.001
65+	152	53.3 (52.1; 54.6)	383	53.7 (52.5 - 53.5)	0.63

*Data source: Avery J, et al., 2004

**Two tailed t test of the PCS and MCS mean across gender and age group between NSW nurses & midwives and South Australian population.

Table 3. SF-12 domain scores for nurses and midwives in NSW

SF-12 domains	Age groups, years						P value*
	18-24	25-34	35-44	45-54	55-64	65+	
Physical functioning	53.6 (6.6)	53.9 (6.3)	52.8 (7.3)	51.4 (8.3)	49.6 (8.9)	48.0 (9.3)	<0.001
Role physical	51.3 (8.6)	51.0 (8.3)	51.6 (7.8)	51.1 (8.5)	50.9 (8.1)	50.7 (7.9)	0.43
Role emotional	47.5 (10.0)	48.4 (10.0)	49.2 (8.9)	49.9 (8.8)	50.9 (8.2)	52.4 (6.4)	<0.001
Social functioning	46.9 (9.6)	47.3 (9.5)	48.8 (8.8)	49.1 (9.2)	50.3 (8.7)	51.0 (8.0)	<0.001
Mental health	46.3 (8.7)	46.9 (9.5)	47.3 (9.3)	48.8 (9.3)	49.8 (8.9)	52.0 (9.0)	<0.001
Vitality	49.5 (9.3)	48.4 (9.4)	49.2 (9.5)	50.7 (9.5)	51.6 (9.4)	53.3 (9.4)	<0.001
Bodily pain	50.7 (7.4)	50.6 (7.6)	50.4 (8.5)	50.2 (8.5)	49.5 (8.5)	49.5 (8.4)	0.001
General health	49.2 (10.2)	50.9 (10.4)	51.5 (9.8)	51.4 (9.9)	51.4 (9.2)	52.7 (8.6)	0.03

*ANOVA used to examine the association between age and each SF-12 domain.

Table 4. Associations between predictive variables and physical and mental component scores of quality of life

a) Physical Component Scores (PCS)

Factor	Final Multivariate Model	
	Coefficient (95% CI)	P value
Age	-0.10 (-0.12; -0.08)	<0.001
Work role		
Foundational	1	
Advanced practice	0.87 (0.06; 1.67)	0.04
Domain specific	1.33 (0.72; 1.93)	<0.001
AIN	-0.24 (-1.32; 0.83)	0.66
Sick days		
None	1	
At least one day	-1.40 (-1.96; -0.84)	<0.001
Admission to hospital		
Yes	1	
None	1.72 (1.13; 2.31)	<0.001
Overweight/ obesity		
Under/ normal weight	1	
Overweight/ obese	-3.57 (-4.07; -3.08)	<0.001
Smoking status		
Not daily smoker	1	
Daily smoker	-1.53 (-2.23; -0.84)	<0.001
Physical activity		
Not meet the guideline	1	
Meeting the guideline	2.16 (1.72; 2.60)	<0.001
Sleep disorder		
No problem	1	
Mild	-1.41 (-1.92; -0.90)	<0.001
Moderate/severe	-2.41 (-3.00; -1.82)	<0.001
Very severe	-5.55 (-7.04; -4.06)	<0.001
Number of diseases		
None	1	
One	-0.90 (-1.47; -0.32)	<0.001
Two	-1.86 (-2.53; -1.20)	<0.001
Three or more	-4.06 (-4.78; -3.34)	<0.001
Prescribed medication use		
None	1	
At least one	-1.06 (-1.55; -0.58)	<0.001

b) Mental Component Scores (MCS)

Factor	Final Multivariate Model	
	Coefficient (95% CI)	P value
Age	0.15 (0.13; 0.18)	<0.001
Job satisfaction		
Neither agree nor disagree/ disagree/ strongly disagree	1	
Agree/ strong agree	5.04 (4.48; 5.61)	<0.001
Care assistance to family		
No	1	
Yes	-1.18 (-1.71; -0.64)	<0.001
Any work injury/abuse		
No	1	
Yes	-1.63 (-2.20; -1.05)	<0.001
Smoking status		
No	1	
Daily smoker	-1.27 (-2.06; -0.48)	0.002
Pain frequency		
None/ rarely	1	
Sometimes/ more often	-1.53 (-2.12; -0.95)	<0.001
Shift work*sleep disorder		
Office hours*no sleep disorder	1	
Night shift*mild sleep disorder	-0.37 (-1.52; 0.78)	0.53
Night shift*moderate/severe sleep disorder	-0.21 (-1.53; 1.11)	0.75
Night shift* very severe sleep disorder	-5.60 (-9.42; -1.77)	0.004

Table 5. Quality of life in relation to intention to leave nursing/midwifery employment

Predictors	Outcome		
	Intention to leave		
	No (%)	Yes (%)	
	77.9%	22.1%	
5a: PCS	Reference	OR [‡] (95% CI)	P value
Crude Model	1	0.99 (0.99; 1.00)	0.22
Model 1 ^a	1	0.99 (0.98; 1.00)	0.04
Model 2 ^b	1	1.00 (0.99; 1.01)	0.98
Model 3 ^c	1	1.00 (0.99; 1.01)	0.83
5b: MCS			
Crude Model	1	0.96 (0.96; 0.97)	<0.001
Model 1 ^a	1	0.96 (0.96; 0.97)	<0.001
Model 2 ^b	1	0.98 (0.97; 0.99)	0.003
Model 3 ^c	1	0.98 (0.97; 0.99)	0.005

‡ OR: Odds Ratio.

Model 1^a: after adjusting for demographic factors;

Model 2^b: after adjusting for demographic and work-related factors;

Model 3^c: after adjusting for demographic, work-related factors and health-related factors.