Review Article

Workplace stress and resilience in the Australian nursing workforce: A Comprehensive Integrative Review

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ABSTRACT

This integrative review aimed to identify and synthesize evidence on workplace stress and resilience in the Australian nursing workforce. A search of the published literature was conducted using EMBASE, MEDLINE, CINAHL (EBSCO), PsycINFO, Web of Science, and Scopus. The search was limited to papers published in English from January 2008 to December 2018. The review integrated both qualitative and quantitative data into a single synthesis. Of the 41 papers that met the inclusion criteria, 65.85% (27/41) used quantitative data, 29.26% (12/41) used qualitative data, and 4.87% (2/41) used mixed methods. About 48.78% (20/41) of the papers addressed resilience issues, 46.34% (19/41) addressed workplace stress, and 4.87% (2/41) addressed both workplace stress and resilience. The synthesis indicated that nurses experience moderate to high levels of stress. Several individual attributes and organizational resources are employed by nurses to manage workplace adversity. The individual attributes include the use of work–life balance and organizing work as a mindful strategy, as well as self-reliance, passion and interest, positive thinking, and emotional intelligence as self-efficacy mechanisms. The organizational resources used to build resilience are support services (both formal and informal), leadership, and role modeling. The empirical studies on resilience largely addresses individual attributes and organizational resources used to build resilience, with relatively few studies focusing on workplace interventions. Our review recommends that research attention be devoted to educational interventions to achieve sustainable improvements in the mental health and wellbeing of nurses.

Keywords: stress, coping strategies, resilience, workplace, mental health nursing, Australia

INTRODUCTION

Resilience has historically been defined and measured using several theoretical and conceptual approaches (Aburn, Gott, & Hoare, 2016; Delgado, Upton, Ranse, Furness, & Foster, 2017). Resilience is a dynamic and adaptable concept, especially in the context of overcoming adversity within the parameters of the individual developmental and transformative continuum (Aburn et al., 2016; Scoloveno, 2016). In addition, resilience is defined as the ability to bounce back, overcome adversity, adapt, and adjust, as well as maintain good mental health (Aburn et al., 2016; Earvolino-Ramirez, 2007; Garcia-Dia, DiNapoli, Garcia-Ona, Jakubowski, & O'flaherty, 2013). Specifically, Scoloveno (2016, p. 3) described resilience as "the ability of individuals, families and groups to successfully function and adapt and cope in spite of psychological, sociological, cultural and/or physical adversity."

During past decades, considerable global attention has been drawn to resilience employed to mitigate the negative effects of workplace stress and to prevent poor psychosocial outcomes among nurses (Delgado et al., 2017; Garcia-Dia et al., 2013; Turner, 2014). Several studies have identified significant outcomes or consequences of resilience. The outcomes are largely related to effective coping, mastery of positive adaptation (Earvolino-Ramirez, 2007; Garcia-Dia et al., 2013), sound mind and body, personal control, psychological adjustment, and personal growth (Garcia-Dia et al., 2013). Specifically, some studies have recommended that resilience is not only significant for enhancing the psychological wellbeing of individual nurses, but also for improving mental health service delivery—particularly in ensuring the longevity and retention of the nursing workforce (Kim & Windsor, 2015; Turner, 2014).

Consequently, several studies have developed theoretical models to facilitate understandings of resilience among workplace nurses (eg. nurses working in health facility setting) (Cusack et al., 2016; Earvolino-Ramirez, 2007; Garcia-Dia et al., 2013; Rees, Breen, Cusack, & Hegney, 2015; Scoloveno, 2016; Turner, 2014; Zander & Hutton, 2009). The theoretical models have been explained according to different interrelated sub-constructs. Generally, the predicting or protective factors used to build resilience in workplace nursing can be categorized according to individual attributes, organizational (eg. workplace factors) and external factors (Garcia-Dia et al., 2013; Kim

& Windsor, 2015; Scoloveno, 2016; Yılmaz, 2017). Individual, organizational, and external factors can individually or jointly contribute to building resilience among workplace nurses. The individual characteristics, which appear as internal factors, are personality traits, cognitive ability, neuroplasticity, self-efficacy (self-help skills) (Garcia-Dia et al., 2013; Rees et al., 2015), optimism and hope (Scoloveno, 2016), a sense of humor, mindfulness (control), competence, spirituality, adaptability, and a positive identity (Rees et al., 2015; Yılmaz, 2017). Conversely, the organizational factors are mostly characterized by professional skills development, social support, a supportive workplace environment, work programs (bio-psychosocial health programs), and interventions implemented by workplace organizations (Delgado et al., 2017; Scoloveno, 2016; Yılmaz, 2017). In addition, Yılmaz (2017) recommended that professional attributes associated with cultural generalities—such as altruism, mentoring, setting a good example, coaching, leading, and motivating—can be encouraged among the nursing profession to facilitate resilience. Some studies have indicated that external factors—including family, community, and socioeconomic resources—can contribute to building resilience in the nursing workforce (Garcia-Dia et al., 2013; Kim & Windsor, 2015).

In Australia, there is growing evidence regarding the effect of stress among workplace nurses. The stressors may be caused by several factors, including organizational and individual factors. Consequently, resilience seems important for nurses, as their organizational environment includes stressors that contribute to psychological distress. Resilience and its associated coping strategies may be employed to mitigate the workplace stress faced by nurses. This issue has resulted in growing empirical studies on resilience employed to manage workplace stress. However, only a few studies have attempted to synthesize evidence on the concept. A preliminary search as part of this integrative review identified two papers that sought to synthesize evidence on stress and coping mechanisms, as well as models of resilience, among Australian workplace nurses (Lim, Bogossian, & Ahern, 2010; Zander & Hutton, 2009). Of these two studies, one aimed to identify the factors that contribute to stress, the effects of stress on health and wellbeing, and coping strategies to manage stress (Lim et al., 2010), while the other study addressed stress, yet was limited to oncology nurses (Zander & Hutton, 2009). Critically, no study has been undertaken to aggregate a synthesis of both

qualitative and quantitative studies regarding resilience displayed by Australian nurses at work.

As such, this study aims to contribute to the research lacuna by conducting an integrative review into the level of stress and the resilience developed by Australian nurses to reduce workplace adversity. The study specifically aims to identify the levels of stress, and synthesize evidence on the individual attributes and organizational resources used to build resilience.

The review findings are significant for several reasons. The evidence is expected to inform policy decision making on the wellbeing of the nursing workforce and to strengthen human resource management for health. The evidence is also considered to be valuable to policy makers and managers in preventing stress and burnout in the nursing workforce. Finally, the evidence can guide researchers and clinicians with regard to directions for future research into building resilience among nurses and student nurses.

METHODS

Methodology

The methodology used for this integrative review was conducted according to Whittemore and Knafl (2005). An integrative review is an approach that allows simultaneous inclusion of diverse methodologies (i.e., experimental and non-experimental research) and varied perspectives to fully understand the phenomenon of concern (Hopia, Latvala, & Liimatainen, 2016; Whittemore & Knafl, 2005). The integrative review methods aim to use diverse data sources to develop a holistic understanding of resilience in nursing. This review method can contribute greatly to evidence-based practice for nursing. The methodology involves five stages:

- problem identification (ensuring that the research question and purpose are clearly defined)
- literature search (incorporating a comprehensive search strategy)
- data evaluation (focusing methodological quality)
- data analysis (data reduction, display, comparison, and conclusions)

- presentation (synthesizing findings in a model or theory, and describing the implications for practice, policy, and research) (Whittemore & Knafl, 2005).

Inclusion criteria

The integrative review included papers that used a qualitative, quantitative, or mixed-methods approach. The quantitative papers targeted studies that used quantitative randomized controlled trials, quantitative non-randomized designs (analytical cross-sectional), and quantitative descriptive studies. The qualitative papers broadly used phenomenological, grounded theory, narrative, ethnography, and participatory methodology. The integrative review included papers that targeted all resilience issues in nursing workforce, papers that assessed workplace stress among nurses, and papers that examined the effect of resilience in mitigating workplace adversity. The included articles were limited to those that targeted Australian nurses.

Exclusion criteria

The review excluded papers that did not address resilience in nursing; that targeted resilience in organizations outside a nursing environment; and that focused on nursing students, nurses in an education setting, or new graduates and nursing managers. Nurses working in these environment were excluded because their experience regarding stress and resilience may differ from nurses in the hospital setting. Other general exclusion criteria were conference abstracts, papers that present opinion, book chapters, editorials, commentaries, clinical case and review studies. The review also excluded papers published prior to 2008, as well as non-English-language articles.

Search strategy

The integrative review included all peer-reviewed published articles addressing resilience and the coping strategies used to manage stress among workplace nurses in Australia. The searches of published articles were conducted from six electronic databases: EMBASE, CINAHL (EBSCO), Web of Science, Scopus, PsycINFO, and MEDLINE. The searches of published articles were conducted according to the Joanna Briggs Institute (JBI) recommended guidelines for conducting systematic reviews (Pearson et al., 2014). In particular, a three-step search strategy was used to conduct the search for information. An initial limited search of MEDLINE and EMBASE was

conducted, followed by analysis of the text contained in the title and abstract, and of the index terms used to describe the article (Pearson et al., 2014). A second search using all identified keywords and index terms was then conducted across all remaining five databases. Finally, the reference lists of all identified articles were hand-searched for additional studies (Pearson et al., 2014). The review considered only studies published in the English language. Studies published from January 2008 to December 2018 were considered for inclusion in this review.

Search terms and Boolean operators

This study used the following search terms:

("nurses" OR "nurse resilience*" OR "workplace resilience" OR "team resilience" OR "team effectiveness" OR "employee resilience" OR "organizational resilience" OR "resilience" or "psychological") AND ("wellbeing" OR "adaptation" OR "coping behavior" OR "job satisfaction" OR "job performance" OR "job satisfaction") AND ("stress management" or "stress" or "nurse workplace stress" OR "burnout" OR "professional" OR "workplace" or "workplace stress" OR "occupational stress" OR "depression" OR "anxiety").

Selection process

The review used several stages to manage the selection of included articles (Pearson et al., 2014). Two authors independently screened the titles of articles and then approved those that met the selection criteria. All authors reviewed the abstracts and agreed on those that needed full-text screening. Additionally, the authors screened all full-text articles and confirmed that the information and records met the inclusion criteria. All authors used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flowchart for systematic reviews (Moher, Liberati, Tetzlaff, & Altman, 2009) to represent the selection processes (see Figure 1).

Data management and extraction

Two reviewers independently managed the data extraction process. Endnote X8 software was used to manage the search results, screening, review of articles, and removal of duplicate references. The authors developed a data extraction form to handle all aspects of data extraction (Appendix 1). The data extraction form was developed

according to Cochrane and the JBI manuals (Pearson et al., 2014) for conducting systematic reviews, as well as consultation with experts in methodologies and the subject area. The authors extracted the results of the included papers in numerical, tabular, and textual format (Pearson et al., 2014). Categories that were extracted included the study details (citation, year of publication, author, contact details of lead author, and funder/sponsoring organization), publication source, methodological characteristics, study population, subject area (e.g., nurses' workplace stress, effect of nurses' workplace stress, concept of resilience, antecedents to resilience, and effect of resilience on workplace nurses' stress), existing interventions and outcomes, additional information on resilience, recommendations, and other potential references to follow up.

Assessment of methodological quality

The methodological quality of all included papers was independently assessed or appraised by two reviewers. The authors also developed a critical appraisal checklist using the Mixed Methods Appraisal Tool (Hong et al., 2018) and JBI (2017) critical appraisal tool. The critical appraisal tool was subdivided into sections. The sections included reviewers' details, study details (methods, study design, data, and analysis), screening questions (categorized according to qualitative, quantitative randomized controlled, and quantitative non-randomized trials, including cohort study, case-control study, analytical cross-sectional study, quantitative descriptive study, systematic review, and mixed-methods study), and overall quality score. Each of the subsections had specific questions related to methodological and reporting quality (Appendix 2). The appraisal was conducted to assess the methodological quality of the included papers and to further determine whether to include or exclude articles, or to seek further information from authors. The methodological quality scores were categorized into low quality (a score below 25%), medium quality (a score of 50%), and high quality (a score of 70% or above). The scores were computed by summing the number of 'yes' occasions for each subsection of the questions related to the methodological criteria, and further expressing them as a percentage (Hong et al., 2018).

Data synthesis

The extracted data were analyzed using a mixed-methods synthesis (Pearson et al., 2014; Whittemore & Knafl, 2005). The authors coded the quantitative and qualitative

data together. Data display matrices were developed to document all the coded ideas from the extracted data (Whittemore & Knafl, 2005). Alphabets and colors were assigned to each of the coded ideas. The resulting codes from quantitative and qualitative data were used to generate a descriptive themes (Pearson et al., 2014). The themes were consistent with the various concepts and theoretical constructs that facilitate resilience in workplace—namely, individual (personal characteristics), organizational (workplace or environmental), and external factors (Cusack et al., 2016; Earvolino-Ramirez, 2007; Garcia-Dia et al., 2013; Rees et al., 2015; Scoloveno, 2016; Turner, 2014; Zander & Hutton, 2009). The background information of the included papers and emerging codes were analyzed using STATA version 15.

RESULTS

Description of retrieved papers

The study identified 406 papers from all databases searched, after which 83 duplicate records were deleted. Of the non-duplicate records, 323 papers were screened for eligibility, after which 266 were excluded. After data extraction of 57 full-text articles and methodological quality assessment, one paper was identified from the reference list, and 17 papers were excluded. Overall, 41 papers were included in the final synthesis (see Figure 1). Of the 41 papers, 40 met the criteria for high methodological quality assessment, while only one paper had medium quality (see Table 1).

Insert Figure 1—Flowchart of included papers

Characteristics of included papers

Most of the included papers reported the study design that was used, while 29.26% (12/41) did not report the study design. Of the papers reporting a study design, more than one-third (12/29; 41.37%) used cross-sectional design, 17.24 (5/29) used interpretive phenomenological approaches, and 10.34 (3/29) used case studies (see Table 1). Most of the included papers used quantitative data (27/41; 65.85), while 29.26% (12/41) used qualitative data and 4.87% (2/41) used mixed methods. More than one-third of the included papers (20/41; 48.78%) addressed resilience issues, while 46.34% (19/41) addressed stress, and 4.87% (2/41) addressed both stress and resilience. Most of the included papers employed several validated instruments, while a few used

qualitative data collection approaches, such as in-depth interviews, focus group discussions, and workshops (see Table 1). Most of the included papers (25/41; 60.97%) recruited both males and females, while more than one-third (12/29; 41.37%) targeted only females. The majority of included papers (25/41; 60.97%) analyzed the results using descriptive and inferential statistics, while 26.82% (11/41) used thematic analysis, 4.87% used descriptive statistics, and 4.87% used concurrent analysis (see Table 1).

Insert Table 1—Characteristics of included articles

Insert Table 2—Themes

Levels of stress among workplace nurses

Most of the studies reported that the majority of Australian nurses experience a significantly moderate to higher level of stress during their working shift (see Table 2). Some studies categorized the stressors according to job-related issues (such as workload, administrative and budgetary issues, or dealing with the media) (Abraham et al., 2018; Bowden et al., 2015; Gabrielle, Jackson, & Mannix, 2008; Hayes, Douglas, & Bonner, 2015; Karimi, Leggat, Donohue, Farrell, & Couper, 2014; Opie et al., 2010; Teo, Pick, Newton, Yeung, & Chang, 2013; Teo, Yeung, & Chang, 2012). Other studies reported environmental factors (eg. job tension or role conflict and ambiguity) (Abraham et al., 2018; Tran, Johnson, Fernandez, & Jones, 2010), patient-related stress (eg. patient behavior, interactions with children, or working with critically injured and dying patients) (Abraham et al., 2018; Bowden et al., 2015; Dolan, Strodl, & Hamernik, 2012; Drury, Craigie, Francis, Aoun, & Hegney, 2014), and professional-related factors (eg. skills deficit, lack of time, and the role of nursing profession) (Drury et al., 2014; Karimi, Cheng, Bartram, Leggat, & Sarkeshik, 2015; Teo et al., 2013; Teo et al., 2012; Tran et al., 2010).

Two papers indicated that workplace stress varies according to the time of the work shift and the geographical location of the nurses. For instance, nurses working during workdays or morning/day and night shifts (Dorrian et al., 2011) experience a significantly higher level of stress than do nurses working afternoon shifts. Similarly, Hegney, Eley, Osseiran-Moisson, and Francis (2015) reported that nurses in major cities and rural areas have significantly higher stress levels than do nurses working in

remote areas. Further, two papers highlighted certain physical and psychological symptoms that demonstrate the presence of stress among nurses (Drury et al., 2014; Gabrielle et al., 2008). The psychological symptoms are fatigue, frustration, anger, tears, distraction, and defensiveness, while the physical symptoms are largely associated with illness or injury, tight muscles, and feelings of physical exhaustion (Drury et al., 2014; Gabrielle et al., 2008).

Causative factor of stress among workplace nurses

Workplace bullying

Three of the included papers reported several situations of workplace bullying among nurses (Allen, Holland, & Reynolds, 2015; Dolan et al., 2012; Gabrielle et al., 2008). Some studies highlighted that workplace bullying occurs through poor therapeutic relationships between nurses and patients, as well as among nurses (Dolan et al., 2012; Gabrielle et al., 2008). In particular, workplace bullying can take the form of physical aggression (for example, being slapped or a patient attempting to strangle a colleague) and verbal aggression (for example, being shouted or sworn at or patients directing their frustrations about treatment onto nurses), as well as negative behaviors, such as nurses withholding necessary support and lack of cooperation among nurses (Dolan et al., 2012; Gabrielle et al., 2008).

Impacts and outcomes of stress

Burnout

Ten of the included papers reported the levels of burnout experienced by the Australian nursing workforce (see Table 2). Several studies suggested that nurses experience moderate to high levels of personal and work-related burnout (Allen et al., 2015; Creedy, Sidebotham, Gamble, Pallant, & Fenwick, 2017; Guo et al., 2018; Hayes et al., 2015; Hegney, Eley, et al., 2015; Hegney, Rees, Eley, Osseiran-Moisson, & Francis, 2015; Holland, Allen, & Cooper, 2013; Kornhaber & Wilson, 2011b). For example, two papers indicated that the mean burnout score among a sample of 762 registered nurses was 54 out of 100 (Allen et al., 2015; Holland et al., 2013). The burnout was measured using the seven item burnout subscale from the Copenhagen Burnout Inventory (CBI). The items are rated on a five-point scale ranging from ‘never’ (or ‘to a very low

degree') to 'always' (or 'to a very high degree'). The responses to each item is re-coded on a scale from 0 to 100 (with higher scores indicating greater work burnout). In addition, about 36.4% (n = 356 of 978 cases) of nurses in a study reported moderate work-related burnout whilst 10.4% (n = 102 of 984 cases) reported moderate or higher client-related burnout (Creedy et al., 2017). Moreover, in a sample of 100 Australian nurses, 66.0% and 22.0% suffered burnout symptoms and severe burnout, respectively (Guo et al., 2018). Contrary, two papers reported low levels of burnout (Dolan et al., 2012; McMillan et al., 2016).

Five studies demonstrated that several individual and organizational factors are associated with burnout among nurses (Dolan et al., 2012; Guo et al., 2018; Holland et al., 2013; Kornhaber & Wilson, 2011b; McMillan et al., 2016). The individual factors associated with burnout are the gender, age, and level of the service provider (eg. primary, secondary or tertiary); years or period of nursing and workload (Dolan et al., 2012; Guo et al., 2018; Holland et al., 2013; Kornhaber & Wilson, 2011b). Specifically, some studies recommended that nurses who have higher burnout tend to be younger (Holland et al., 2013), to be men (Dolan et al., 2012), and to have nursed the same patient for long periods (Kornhaber & Wilson, 2011b). Conversely, the organizational factors associated with burnout include the extent at which employees direct voice are considered in organizational decision making (direct voice is extent at which employees concerns and voices are considered in organizational decision), supervision approaches, rewards, and the adequacy of training and psychosocial care management strategies (Holland et al., 2013; McMillan et al., 2016)

Psychological distress

Ten papers described the psychological distress experienced by Australian nurses (see Table 2). Several studies highlighted that nurses experience moderate to high levels of psychological detachment from their work (Gabrielle et al., 2008; Hayes et al., 2015). Most studies further expressed that nurses' psychological distress is largely associated with emotional dissonance, emotional labor, and emotional work of the nursing profession (Karimi et al., 2014; Kornhaber & Wilson, 2011a; Opie et al., 2010; Pisaniello, Winefield, & Delfabbro, 2012; Rose & Glass, 2008). Other organizational factors—such as workload, the limited workforce, responsibilities, and expectations—as

well as social issues are significantly associated with psychological distress and emotional exhaustion (Gabrielle et al., 2008; Opie et al., 2010). The increasing emotional labor and emotional work of nurses contribute to low wellbeing (eg. poor mental health wellbeing). Conversely, another study highlighted that emotional work in the form of companionship contributes to positive health and wellbeing (Pisaniello et al., 2012).

Two papers reported that the influence of emotional labor and emotional work on psychological health and organizational outcomes differ, particularly according to the geographical setting of nurses (Opie et al., 2010; Pisaniello et al., 2012).. For instance, Opie et al. (2010) recommended that nurses working in very remote areas of Australia have significantly higher levels of emotional exhaustion than do other nurses in major cities and rural communities. In some instances, the emotional demand and emotional labor of the nursing profession encourage nurses to leave the profession (Gabrielle et al., 2008).

Depression and anxiety

Four papers highlighted that nurses experience moderate, severe, and extreme levels of depression and anxiety (Creedy et al., 2017; Drury et al., 2014; Hegney et al., 2014; Hegney, Rees, et al., 2015). For example, approximately 20% of nurses in a sample of 1,037 reported a symptom of depression (17.3%) or anxiety (20.4%) (Creedy et al., 2017). In addition, the mean depression and anxiety scores of a sample of 1,743 nurses were 4.38 (*SD* = 6.39) and 5.46 (*SD* = 7.76), respectively. (The depression and anxiety was measured using a 21 item scale, which is rated on a four-point Likert scale, 0 – not at all, to 3 – very much/most of the time. The responses to each item was re-coded on a scale from 0 to 100. The higher scores indicate higher levels or severe depression and anxiety) (Hegney, Rees, et al., 2015).

Three studies indicated that individual and environmental factors significantly contribute to increasing the burden of anxiety among nurses (Drury et al., 2014; Hegney et al., 2014; Hegney, Rees, et al., 2015). Two papers highlighted that the sector of nursing (aged care), as well as nurses with a very distressed profile, are significantly more anxious than nurses in other sectors (Hegney et al., 2014; Hegney, Rees, et al.,

2015). In addition, Drury et al. (2014) reported that the work environment can invoke significant anxiety.

Levels of resilience among workplace nurses

Thirteen of the included papers focused on the resilience employed by Australian nurses (see Table 2). Specifically, Dolan et al. (2012) reported that Australian nurses had moderate levels of resilience. Three papers concluded that the mean resilience score ranged from 58.22 (*SD* 16.06) to 70.02. The resilience was measured using 25 item scale, which is rated on a five point response scale, 0 = not true at all, 4 = true all the time. The responses to each item was re-coded on a scale from 0 to 100. The higher scores indicate higher levels of resilience. (Guo et al., 2018; Hegney, Eley, et al., 2015; Hegney, Rees, et al., 2015). Hegney, Eley, et al. (2015) reported that the resilience score is similar across geographic area (eg. mean of major cities = 70.38, mean of rural areas = 69.06, and mean of remote areas = 69.17). However, two papers concluded that the resilience scores differed according to the years of working experience (Gabrielle et al., 2008; Mills, Woods, Harrison, Chamberlain-Salaun, & Spencer, 2017). For instance, Mills et al. (2017) suggested that the resilience score in a sample of 183 nurses was highest in the first year post-graduation, yet slightly declined until stabilizing around three to five years post-graduation.

Individual attributes used to build resilience

Organizing work as a mindful strategy

Mindfulness is a trait-like tendency that involves focusing on an experience occurring in the present in a non-judgmental way. Mindfulness is important particularly when nurses organize themselves and detach from highly charged emotional situations and reflect, learn and move on. In particular, nurses who are mindful can organize themselves and step back mentally and think about what is going on and what can be done (Cusack et al., 2016; Rees et al., 2015). Seven of the included papers highlighted that organizing work is used as a mindful strategy by nurses to improve their resilience at work (Cameron & Brownie, 2010; Dolan et al., 2012; Gabrielle et al., 2008; Gao, Newcombe, Tilse, Wilson, & Tuckett, 2014; McDonald, Jackson, Vickers, & Wilkes, 2016; McDonald, Jackson, Wilkes, & Vickers, 2013; Perry, Nicholls, Duffield, & Gallagher,

2017). Some studies recommended that these mindful approaches take the form of flexible work schedules (reducing working hours or refusing to work double shifts or overtime) (Dolan et al., 2012; Gabrielle et al., 2008; Perry et al., 2017), lower job demands (moving to physically lighter nursing, limiting exposure to difficult physical work, and deliberate rest and relaxation to recuperate when off duty) (Dolan et al., 2012; Gabrielle et al., 2008; Gao et al., 2014), increased personal autonomy (greater control over work) (McDonald et al., 2016; McDonald et al., 2013), work in interesting and specialized roles, higher coping resources (McDonald et al., 2016), and insight into the ability to recognize stressors (Cameron & Brownie, 2010). Importantly, some studies suggested that lower job demands and higher coping resources have the ability to improve psychological health (Gao et al., 2014), while personal autonomy improves competence and control over the job (McDonald et al., 2016). Nurses who have personal autonomy over their work are able to concentrate on providing person-centered care and meaningful professional engagement with their patients, and subsequently achieve higher confidence, efficacy, and job satisfaction levels (McDonald et al., 2016).

Work–life balance as a mindful strategy

Six of the included papers recommended work–life balance as a mindful strategy employed to reduce workplace stress among nurses (see Table 2). Some of the work–life balance strategies were feeling balance (self-nurturing), regular exercise and taking recreational activities and setting emotional boundaries. Three papers highlighted that exercise and recreational activities inside and outside the work environment can encompass novelty, fun, joy, laughter, and relaxation (Cameron & Brownie, 2010; Cope, Jones, & Hendricks, 2016b; Kornhaber & Wilson, 2011a). Specifically, Rose and Glass (2008) suggested that balance is associated with self-nurturing and the interconnectedness of body, mind, and spirit to enhance wellbeing. Similarly, emotional boundary strategies include avoiding over-involvement with clients, separating work from home or family life, and obtaining closure following a client's death (Rose & Glass, 2008). Two papers further highlighted that the ability to maintain work–life balance helped prevent feelings of emotional distress and promoted wellbeing (Cameron & Brownie, 2010; Rose & Glass, 2008).

Self-reliance mechanism as a self-efficacy strategy

Nine of the included papers recommended self-reliance strategies employed by nurses to build resilience to overcome workplace adversity (Cameron & Brownie, 2010; Cope, Jones, & Hendricks, 2016a; Cope et al., 2016b; Dolan et al., 2012; Kornhaber & Wilson, 2011a; McDonald et al., 2016; McDonald et al., 2013; Rose & Glass, 2008; Slatyer, Craigie, Rees, et al., 2018). Some studies suggested that the self-reliance strategies employed by nurses included self-caring behaviors or self-management skills, self-control, growing through adversity (Cope et al., 2016a, 2016b; Kornhaber & Wilson, 2011a; McDonald et al., 2013; Rose & Glass, 2008), self-confidence, assertive communication, self-validation, self-reflection (McDonald et al., 2013; Rose & Glass, 2008; Slatyer, Craigie, Rees, et al., 2018), and having insight into one's circumstances (Slatyer, Craigie, Rees, et al., 2018). Two of the included papers further suggested that self-reliance employed by nurses improves the ability to persevere, sometimes over long careers, and to subsequently sustain physical, mental, and emotional health among nurses (McDonald et al., 2016; McDonald et al., 2013)..

Positive thinking as a self-efficacy strategy

Four of the included papers suggested that positive thinking could be used to overcome challenging stressful situations in the workplace (see Table 2). The positive-thinking mechanisms included the ability to think differently about ways to solve problems (taking action) (Abraham et al., 2018), staying positive in the midst of adversity (Cameron & Brownie, 2010; Cope et al., 2016a, 2016b), optimism (Cameron & Brownie, 2010), and taking on challenges (Cope et al., 2016b).

Emotional intelligence as a self-efficacy strategy

Five of the included papers recommended that emotional distancing or emotional intelligence (ability to handle emotions) can be used as resilience to handle workplace adversity (see Table 2). Two papers indicated that emotional intelligence has the ability to help nurses handle patient care, regardless of stressors (arising from lengthy, painful, and traumatic care) (Dolan et al., 2012; Kornhaber & Wilson, 2011a). Some studies highlighted that emotional intelligence is significantly associated with nurses' wellbeing (Karimi et al., 2015; Karimi et al., 2014). In particular, higher emotional intelligence is

significantly associated with higher wellbeing (Karimi et al., 2015; Karimi et al., 2014). Some studies identified different levels of emotional distancing among workplace nurses. For instance, Karimi et al. (2014) reported that the mean emotional intelligence in a sample of 312 community nurses were 2.88 and 3.73, respectively (The emotional intelligence was rated on a five-point Likert scale ranging from 1 'strongly agree' to 5 'strongly disagree. The responses to each item was re-coded on a scale from 1 to 5. The higher scores indicate a higher emotional intelligence level for nurses).

Passion and interest as a self-efficacy strategy

Some papers highlighted that nurses' passion and interest in nursing motivated them to cope with workplace adversity (Cope et al., 2016a, 2016b). For example, Cope et al. (2016b) concluded that nurses have a sense of pride and value in their professional role and satisfaction with their career choice. The sense of value among the nursing profession significantly influences nurses to cope with workplace adversity.

Workplace resilience interventions for nurses

Six of the included papers identified several interventions that have been piloted to reduce stress, burnout, and psychological distress among workplace nurses (Craigie et al., 2016; Foster et al., 2018; Foureur, Besley, Burton, Yu, & Crisp, 2013; McDonald et al., 2013; Perry et al., 2017; Slatyer, Craigie, Heritage, Davis, & Rees, 2018; Slatyer, Craigie, Rees, et al., 2018). Three of the interventions were mindful self-care and resiliency (MSCR) interventions (Craigie et al., 2016; Slatyer, Craigie, Heritage, et al., 2018; Slatyer, Craigie, Rees, et al., 2018), while the remaining interventions included a work-based educational intervention to promote personal resilience (McDonald et al., 2013), a program for promoting adult resilience (Foster et al., 2018), a program for mindfulness-based stress reduction (Foureur et al., 2013) (see Table 3).

All the included papers describing mindful self-care and resiliency interventions comprised an average of one to two days of an educational workshop, which was structured into different components. The workshop from all the included papers describing mindful self-care and resiliency interventions was mostly followed by a daily or weekly mindfulness practice session for an average of four to 24 weeks (Craigie et al., 2016; Slatyer, Craigie, Heritage, et al., 2018; Slatyer, Craigie, Rees, et al., 2018).

Three papers highlighted that the workshop generally focused on modules that included compassion fatigue resiliency (based on Eric Gentry's Compassion Fatigue Prevention and Resiliency concepts) and understanding the concept of mindfulness (Craigie et al., 2016; Slatyer, Craigie, Heritage, et al., 2018; Slatyer, Craigie, Rees, et al., 2018).

In addition, Foureur et al. (2013) highlighted that the mindfulness-based stress reduction program (a one-day program) is taught by an experienced psychologist. The program is followed by daily mindfulness practice sessions (audio-recorded by the primary workshop facilitator) of 20 minutes for an eight-week period. Further, McDonald et al. (2013) described that the work-based educational intervention workshops and a mentoring program used to promote personal resilience are conducted over a six-month period. The workshops were held over a whole day each month, onsite at the hospital, but a place outside their usual work environment. The content of the program is developed around mentoring and maintaining positive and nurturing relationships and networks, a positive outlook, hardiness, intellectual flexibility, emotional intelligence, life balance, spirituality, reflection, critical thinking, and therapeutic elements (see Table 3) (McDonald et al., 2013).

Insert Table 3—Intervention studies on workplace resilience

Effectiveness of resilience interventions

Five of the included papers revealed that the piloted resilience interventions were effective in mitigating the negative effects of workplace stress (Craigie et al., 2016; Foster et al., 2018; Foureur et al., 2013; Slatyer, Craigie, Heritage, et al., 2018; Slatyer, Craigie, Rees, et al., 2018). Most of the papers highlighted that the piloted interventions were practically feasible and positively accepted among workplace nurses (Craigie et al., 2016; Foster et al., 2018; Foureur et al., 2013; Slatyer, Craigie, Heritage, et al., 2018; Slatyer, Craigie, Rees, et al., 2018). Two papers concluded that participants in resilience educational workshops felt comfortable devoting resources to their own wellbeing (Slatyer, Craigie, Rees, et al., 2018) and had high levels of satisfaction with the intervention (Foster et al., 2018). For example, the level of satisfaction with a promoting adult resilience education program was very high (range: 4.2–4.7, with the range of values from 0 to 5, where a value of 5 represents absolute satisfaction), while satisfaction with skills learned was high to very high (range = 3.8–4.5) (Foster et al.,

2018). Similarly, 94% of 21 participants who completed a MSCR program continued to use at least one learned practice in the workplace or at home during the weeks after the program (Slatyer, Craigie, Rees, et al., 2018).

Further, four of the included papers recommended that resilience educational workshops helped mitigate negative effects on nurses' wellbeing. The educational workshops were reported to have significant reductions on stress, depression, burnout, and trait negative affect (Craigie et al., 2016; Foster et al., 2018; Slatyer, Craigie, Heritage, et al., 2018; Slatyer, Craigie, Rees, et al., 2018), as well as improving levels of compassion, satisfaction, self-compassion, and subjective quality of life (Craigie et al., 2016; Slatyer, Craigie, Heritage, et al., 2018). In particular, in a pilot MSCR intervention, 45% of the 21 nurses who had burnout scores in the high range at pre-test reduced to 15% at post-test and in the follow-up stage (Craigie et al., 2016). Similarly, a statistically significant improvement was observed between pre- and post-intervention compassion satisfaction scores (t [205] = -2.24, p = .026, d = 0.17) and secondary traumatic stress scale (t [205] = 2.43, p = .001, d = 0.52) (Slatyer, Craigie, Heritage, et al., 2018). In addition, some papers highlighted that the educational workshops helped improve the coping self-efficacy and self-regulatory process of the nursing workforce studied (Foster et al., 2018; Slatyer, Craigie, Rees, et al., 2018).

Organizational resources used to build resilience

Leadership

Three of the included papers outlined organizational leadership factors that help mitigate the negative effects of workplace adversity (Cope et al., 2016b; Drury et al., 2014; Perry et al., 2017). Some papers suggested that leadership practices that influence workplace nurses to resist enduring negative emotional states include positive feedback from leaders (Drury et al., 2014), treating staff with respect, and self-aware leaders (Cope et al., 2016b; Drury et al., 2014). In addition, Perry et al. (2017) concluded in the study that the most highly ranked important health-promotion strategies to promote the wellbeing of workplace nurses are leadership (mean score of 4.1 and 4.3, with the range of values from 1 to 5, where a maximum value of 5 represents highest rank) forming collaborative relationships with organizations (mean score 4.3), ensuring equitable

access to interventions for all employees (4.2), and creating opportunities for staff involvement in decision making (mean score 4.2).

Role modeling and mentorship

Two papers suggested that role modeling and mentorship are used as resilience motivators to manage enduring negative emotional states (Cope et al., 2016b; Drury et al., 2014). For instance, role models and mentors provide clinical coaching, counsel and managerial support to nurses. The role modelling and mentorship support help to improve the working environment (Cope et al., 2016b; Drury et al., 2014).

Informal support services

Nine of the included papers recommended that informal support services from collegial networks and personal relationships with families and friends outside of work can be used to mitigate the effects of workplace adversity and improve resilience (Cameron & Brownie, 2010; Cope et al., 2016a, 2016b; Drury et al., 2014; Kornhaber & Wilson, 2011b; McDonald et al., 2016; McDonald et al., 2013; Rose & Glass, 2008; Slatyer, Craigie, Rees, et al., 2018). Two papers suggested that collegial relationships helped to provide positive communication (McDonald et al., 2016; McDonald et al., 2013), reciprocal support, and a sense of belonging in the workplace (McDonald et al., 2013). The collegial networks helped nurses to share insider knowledge about organizational issues, understand the relationship dynamics within the work department (McDonald et al., 2016), and provide and receive support during complex procedures in their clinical practice (Kornhaber & Wilson, 2011b). Further, two papers highlighted that informal support from families and friends enabled nurses to undertake informal debriefing, which facilitated their nursing work (Drury et al., 2014; Rose & Glass, 2008). In particular, McDonald et al. (2016) recommended that external supportive relationships from partners, family, and friends are relevant to increasing nurses' emotional wellbeing and further sustaining a positive self-concept when dealing with workplace adversity.

Formal organizational support services

Four of the included papers for this theme recommended that several formal systemic support services have the ability to enhance the wellbeing of workplace nurses (see Table 1). Some studies highlighted that nurses' wellbeing can be facilitated by health-

promotion (training in mental health, stress management, resilience, and flexible working practice), healthy eating, nutrition, and smoking cessation interventions (Perry et al., 2017), as well as organizational commitment (Teo et al., 2012) and multidisciplinary team collaboration (Kornhaber & Wilson, 2011b)). For instance, Perry et al. (2017) concluded that some healthy eating interventions are important and feasible when enhancing nurses' wellbeing. These interventions include the provision of healthy food options in health facility cafeterias, healthy food options in on-site vending machines, and food labeling, as well as the development and provision of personalized low-fat dietary plans for staff by dieticians. Similarly, some smoking cessation interventions that seem important and feasible among workplace nurses are the promotion of free telephone counseling, internet quit support, self-help manuals, cognitive behavioral therapy, and nicotine replacement therapy (Perry et al., 2017). Further, Kornhaber and Wilson (2011b) suggested that multidisciplinary team collaboration provides workplace nurses with greater support, direction, and assistance in providing nursing care.

Two of the included papers further recommended some formal support or systemic services—such as professional counseling (Kornhaber & Wilson, 2011b), an employee assistance program, or clinical supervision (Rose & Glass, 2008)—as effective methods for managing workplace adversity. Clinical supervision, in particular, is perceived as valuable to nursing practice and the support of emotional wellbeing (Rose & Glass, 2008).

DISCUSSION

This integrative review was conducted to synthesize evidence into the level of stress and the resilience developed by Australian nurses to reduce workplace adversity. The study specifically aims to identify the levels of stress, and synthesize evidence on the individual attributes and organizational resources used to build resilience. The evidence from the review has been discussed according to four themes: (i) levels of stress (causative factors and impacts on workplace nurses), (ii) Individual attributes used to build resilience, (iii) organizational resources used to build resilience, and (iv) workplace resilience interventions for nurses.

Levels of stress (causative factors and impacts on workplace nurses)

The evidence has highlighted that Australian nurses experience moderate to high levels of stress, which are reported to be largely associated with workplace bullying. The increasing workplace adversity affecting nurses with low resilience have significantly led to moderate to higher levels of depression and anxiety, psychological detachment and burnout (Abraham et al., 2018; Gabrielle et al., 2008; Hayes et al., 2015; Teo et al., 2013). The increasing stress levels and associated outcome are caused by individual and environmental or organizational factors. More specifically, workplace organizational factors (such as workload, administrative, and budgetary issues) and environmental factors (including job tension, role conflict, and role ambiguity) significantly contribute to increased stress levels. Conversely, individual factors (such as patient behavior and handing critically injured patients) and professional-related issues account for higher stress levels among nurses (Abraham et al., 2018; Bowden et al., 2015; Dolan et al., 2012; Drury et al., 2014). These individual and organizational factors significantly influence stress levels and contribute to psychological distress and emotional exhaustion. The factors that influence stress level among Australian nursing workforce is consistent with previous literature (Lim et al., 2010; Turner, 2014; Zander & Hutton, 2009; Zander, Hutton, & King, 2013).

Further, the increasing levels of psychological distress have a significant influence on burnout, anxiety, and depression among nurses at work. In most instances, the burnout, anxiety, and depression experienced by nurses differs according to nurses' individual factors (Delgado et al., 2017; Garcia-Dia et al., 2013). The evidence from this review suggests that individual predisposing factors—such as the gender, age, and level of the service provider (primary, secondary, or tertiary); years or period of nursing; workload; distress level; and turnover intention—influence burnout, depression, and anxiety among nurses. The review findings recommend the need to conduct a preventive research and focused interventions into the various predisposing factors influencing burnout, depression and anxiety among the nursing workforce.

The increasing negative emotional state of nursing workforce has several implications for individual nurses, human resources management for nurses, and subsequently the delivery of health services (Cusack et al., 2016; Zander & Hutton, 2009). The poor emotional state of workplace nurses can significantly reduce nurses' productive work, especially in the provision of patient-centered health services. A distressed nurse is

more likely to provide poor services to consumers than is a nurse with improved psychological wellbeing. This review finding is consistent with earlier models that highlight that enduring negative emotional states or emotional affect confronting workplace nurses affect the quality of care provided (Cusack et al., 2016; Rees et al., 2015; Turner, 2014). As such, our review findings recommend that health policy planners and managers should employ workable measures to promote the mental health and wellbeing of workplace nurses. The interventions or mechanisms can be promoted by the Australian healthcare standards authority (Australian Commission on Safety and Quality in Health Care), local health districts, and professional organizations, such as nursing unions and professional colleges.

Individual attributes used to build resilience

The review findings confirm that several individual attributes—such as self-efficacy and mindful strategies—are used to build resilience among workplace nurses. The self-efficacy mechanisms are largely related to self-reliance, positive thinking, emotional intelligence, and passion for and interest in nursing as a profession. The self-reliance mechanisms employed by nurses mostly involve self-caring behaviors or self-management skills, self-control, self-confidence, assertive communication, self-validation, and self-reflection (McDonald et al., 2016; McDonald et al., 2013). The self-reliance mechanisms can strengthen workplace nurses' ability to develop perseverance skills that can help them sustain physical, mental, and emotional health (Garcia-Dia et al., 2013; Scoloveno, 2016). In addition, the positive-thinking mechanisms used to enhance resilience are largely associated with the ability to think differently about ways to solve problems, remain optimistic, and stay positive in situations of adversity and when taking on challenges. The notion of positive thinking as a self-efficacy mechanism is regarded a positive step forward in building resilience (Garcia-Dia et al., 2013; Kim & Windsor, 2015; Scoloveno, 2016; Yılmaz, 2017).

In addition, the review findings confirm that workplace nurses who are able to handle their emotions or who practice emotional distancing are more likely to achieve higher wellbeing and emotional equilibrium (Karimi et al., 2015; Karimi et al., 2014). Further, workplace nurses who demonstrate passion for and interest in nursing have a sense of pride and value in the professional role and are more satisfied with their career choice

(Cusack et al., 2016; Rees et al., 2015). Nurses' passion for and interest in the profession help them build personal resilience (self-efficacy) in managing workplace adversity. The review findings recommend that the various self-efficacy mechanisms practiced among workplace nurses should be promoted to address the adversities in the work environment.

Further, the review findings suggest that several mindful strategies are used by individual workplace nurses to promote and learn about resilience. Indeed, mindfulness is a significant construct that can build and sustain resilience among workplace nurses (Cusack et al., 2016; Rees et al., 2015). Individuals who are mindful have greater ability to manage stressful and highly emotional situations, and subsequently improve their psychological wellbeing (Cusack et al., 2016; Rees et al., 2015). Specifically, the mindful practices that are used to reduce workplace stress include organizing work, maintaining a work–life balance, meditation, relaxation, and clinical supervision, which involves critical reflection. In particular, the evidence suggests that workplace nurses who organize their work according to lower job demands and flexible work schedules, increase personal autonomy, and have insight into identifying stressors. These workplace nurses are more likely to achieve higher job satisfaction and psychological health. Further, workplace nurses who balance their work and life with exercise and recreational activities and who set emotional boundaries have the ability to manage emotional distress and improve wellbeing. Workplace nurses who separate work from home and family, limit their involvement with clients, and obtain closure from patient death and trauma are reported to better control the negative effects of emotional distress and adversity. The review findings confirm previous evidence that recommends the use of mindful practices to mitigate workplace stress. Our evidence recommends that workplace nurses need to be mindful in their workplace, particularly around balancing work with life and family. This is significant when seeking to improve psychological wellbeing and productivity.

Workplace resilience interventions for nurses

The review findings indicated that several interventions have recently been piloted to improve resilience in healthcare facilities in Australia (Craigie et al., 2016; Foster et al., 2018; Foureur et al., 2013; McDonald et al., 2013; Perry et al., 2017; Slatyer, Craigie,

Heritage, et al., 2018; Slatyer, Craigie, Rees, et al., 2018). The interventions include mindfulness self-care and resiliency, work-based educational interventions, a program promoting adult resilience, and mindfulness-based stress reductions. The review findings concluded that piloted resilience interventions are practically feasible and positively accepted to improve the wellbeing of workplace nurses (Craigie et al., 2016; Foster et al., 2018; Foureur et al., 2013; Slatyer, Craigie, Heritage, et al., 2018; Slatyer, Craigie, Rees, et al., 2018). The educational interventions are known to be effective in reducing negative outcomes, such as stress, depression, burnout, and trait negative effect. Moreover, the interventions are effective for improving workplace nurses' level of compassion, satisfaction, self-compassion, and quality of life. However, there have been no evaluation studies investigating the cumulative effect of the resilience-based interventions conducted, or any official recommendations regarding how these interventions might be improved or modified to build and sustain resilience among nurses and their colleagues. The review findings endorse that policymakers, including nursing managers, should employ such educational workshop interventions and health-promotion programs as resilience motivators to manage the psychological and physical wellbeing of nurses. Such interventions can ensure the longevity and retention of the nursing workforce and subsequently improve health service delivery (Kim & Windsor, 2015; Turner, 2014). Further, such interventions can be implemented in a sustainable and measurable manner to achieve a long-term effect on the nursing workforce.

Organizational attributes used to build resilience

The synthesized evidence suggests that some organizational or environmental factors are employed by nurses to mitigate the effects of workplace adversity. The organizational attributes used to manage workplace adversity include leadership, role modeling or mentorship, and support services. Specifically, leadership practices—such as positive feedback to nurses and demonstrating respect—help workplace nurses cope with the negative effects of negative emotional states (Cope et al., 2016b; Drury et al., 2014). In some instances, providing role modeling to nurses in areas such as clinical coaching can help improve the nurses' practice and wellbeing. The organizational resources used to manage resilience in Australian nursing workforce is consistent with previous literature explaining resilience. In particular, previous literature recommend several factors such as professional skills development, professional attributes and

supportive workplace environment as organizational resources to build resilience (Cusack et al., 2016; Delgado et al., 2017; Scoloveno, 2016; Yılmaz, 2017). The review findings recommends that various professional development plan strategies and supportive working environment should be encouraged and promoted in the Australian health care setting.

Moreover, the review findings indicated that several informal and formal support services are used by workplace nurses to cope with their stressful working environment. Informal support—such as collegial networks and personal relationships with families and friends outside work—have the proven ability to improve the mental health and wellbeing of workplace nurses (Cameron & Brownie, 2010; Cope et al., 2016b; Drury et al., 2014; Kornhaber & Wilson, 2011b; McDonald et al., 2016; Rose & Glass, 2008). In most instances, collegial networks promote positive workplace communication, reciprocal support, and a sense of belonging. Informal support from family and friends mostly enables debriefing sessions and enhances positive self-support, which augments nurses' emotional wellbeing, especially in times of workplace adversity. The informal support used to build resilience in Australian nursing workforce confirms previous literature, which recognized informal support as predictive factor (Cusack et al., 2016; Garcia-Dia et al., 2013; Kim & Windsor, 2015; Yılmaz, 2017). In addition, the review findings highlight that formal or systemic support services—such as mental health interventions or training; healthy eating, nutrition, and smoking cessation interventions; organizational commitment; and multidisciplinary collaboration—can also facilitate the wellbeing of workplace nurses (Drury et al., 2014; Kornhaber & Wilson, 2011b; Perry et al., 2017; Teo et al., 2012). Other formal support such as professional counseling, employee assistance program and clinical supervision has proven as effective methods for managing workplace adversity (Kornhaber & Wilson, 2011b; Rose & Glass, 2008).These support services can be used as coping strategies for workplace nurses to allay the negative effects of stress. The support services can nurture and empower nurses to withstand workplace pressures and thus contribute to their mental health and well-being in the workplace (Cusack et al., 2016; Garcia-Dia et al., 2013; Kim & Windsor, 2015; Yılmaz, 2017). The review findings recommend that the organizational or systematic support services that elevate the resilience of workplace nurses should be promoted to improve the wellbeing of nurses at work.

LIMITATIONS

This integrative review has several limitations that require consideration. The limitations of the integrative review are largely pertinent to the search words, language limitations, scope (geographical setting), and period of publication of the included papers. The review was only limited to papers addressing workplace resilience among nurses in the Australian context. In addition, the included papers were limited to those published in English language and falling within the period January 2008 to December 2018. More importantly, the variation in search terms and keywords regarding resilience and stress may have missed some relevant articles. Moreover, limiting studies to only English-language articles and articles published between 2008 and 2018 could have overlooked relevant non-English-language articles and articles published prior to 2008. However, the combination of clearly articulated search methods, consultation with a research librarian, and reviewing articles with multiple experts, as well as the critical appraisal tool used to measure the methodological quality, helped address these various limitations.

CONCLUSION

In summary, the evidence indicates that Australian nurses experience moderate to high levels of stress, which is largely associated with workplace bullying. These nurses also experience moderate to high levels of depression and anxiety, as well as burnout. This review concludes that several individual attributes and organizational (environmental) resources are employed as forms of resilience to manage workplace adversity. The individual attributes include self-reliance, positive thinking, emotional intelligence, passion and interest in nursing, maintaining a work–life-balance, and organizing work. The organizational resources used to build resilience include support services (formal and informal), leadership, and role modeling. In addition, the review concludes that several interventions have recently been piloted to improve resilience in healthcare facilities in Australia. The interventions include mindfulness self-care and resiliency, work-based educational interventions, a program for promoting adult resilience, and mindfulness-based stress reductions. Piloted resilience interventions are practically

feasible and positively accepted to improve the mental health and wellbeing of workplace nurses.

Implications for mental health nursing practice, policy, and future research

This integrative review indicates that there is increasing evidence regarding the resilience strategies employed by workplace nurses in Australia. Of the 41 papers included in this review, 40 met the criteria for high quality, and thus can be used to inform policies aimed at managing the nursing workforce. The evidence largely addresses issues related to individual attributes and organizational resources used to build resilience, with relatively few studies addressing workplace educational interventions or health-promotion programs. In addition, only a few researchers have sought to employ interventional studies to examine the effectiveness of resilience interventions in reducing workplace adversity. There is also a gender bias, with most of the evidence that addresses resilience targeting the female nursing workforce, and limited studies targeting males. Moreover, the existing evidence largely uses quantitative methods, with few studies using quantitative methods or a mixed-methods approach. Thus, this paper presents the following recommendations for mental health nursing practice and policy:

- Advocacy for and awareness of individual attributes and organizational resources used to build resilience in nursing workforce should be funded and prioritized in policy initiatives. In particular, nursing managers and health facility managers should promote and encourage the individual attributes and organizational resources used to build resilience among workplace nurses. This can help reduce the negative effects of enduring negative emotional states and subsequently improve the mental health and wellbeing of the nursing workforce.

- Health policy planners and managers should employ workable measures that can promote the mental health and psychological wellbeing of workplace nurses. Specifically, the current interventions piloted for resilience development in health facilities (such as mindfulness self-care and resiliency, work-based educational interventions, adult resilience programs, and mindfulness-based stress reductions) could be prioritized and implemented to achieve sustainable

psychological and mental health wellbeing outcomes. The interventions or mechanisms can be promoted by the Australian healthcare standards authority (Australian Commission on Safety and Quality in Health Care), local health districts, nursing managers, hospital administrators, and professional organizations, such as nursing unions and professional colleges.

Moreover, this review presents the following recommendations for future research:

- Research on resilience used to manage workplace adversity should be directed toward interventional studies, which can provide sustainable and workable solutions to reduce the stress faced by workplace nurses.
- Resilience research in Australian nursing workforce largely neglects the experiences of males; thus, future research should attempt to explore how men cope with workplace adversity.
- Resilience research in nursing mostly employs quantitative methods, with relatively few studies using qualitative or mixed methods. Thus, this review recommends that future resilience research attempt to use mixed methods to understand the subjective and objective perspectives of mental health nurses.

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References

Abraham, L. J., Thom, O., Greenslade, J. H., Wallis, M., Johnston, A. N. B., Carlstrom, E., . . . Crilly, J. (2018). Morale, stress and coping strategies of staff working in the emergency department: A comparison of two different-sized departments. *EMA - Emergency Medicine Australasia, 30*(3), 375-381. doi:http://dx.doi.org/10.1111/1742-6723.12895

Aburn, G., Gott, M., & Hoare, K. (2016). What is resilience? An integrative review of the empirical literature. *Journal of Advanced Nursing, 72*(5), 980-1000.

Allen, B. C., Holland, P., & Reynolds, R. (2015). The effect of bullying on burnout in nurses: the moderating role of psychological detachment. *Journal of Advanced Nursing, 71*(2), 381-390. doi:https://dx.doi.org/10.1111/jan.12489

Bowden, M., Mukherjee, S., Williams, L., DeGraves, S., Jackson, M., & McCarthy, M. (2015). Work-related stress and reward: An Australian study of multidisciplinary pediatric oncology healthcare providers. *Psycho-Oncology, 24*(11), 1432-1438. doi:http://dx.doi.org/10.1002/pon.3810

Cameron, F., & Brownie, S. (2010). Enhancing resilience in registered aged care nurses. *Australasian Journal on Ageing, 29*(2), 66-71.

Cope, V., Jones, B., & Hendricks, J. (2016a). Residential aged care nurses: portraits of resilience. *Contemporary Nurse, 52*(6), 736-752. doi:https://dx.doi.org/10.1080/10376178.2016.1246950

Cope, V., Jones, B., & Hendricks, J. (2016b). Why nurses chose to remain in the workforce: Portraits of resilience. *Collegian: Journal of the Royal College of Nursing, Australia, 23*(1), 87-95.

Craigie, M., Slatyer, S., Hegney, D., Osseiran-Moisson, R., Gentry, E., Davis, S., . . . Rees, C. (2016). A pilot evaluation of a mindful self-care and resiliency (MSCR) intervention for nurses. *Mindfulness, 7*(3), 764-774. doi:http://dx.doi.org/10.1007/s12671-016-0516-x

Creedy, D. K., Sidebotham, M., Gamble, J., Pallant, J., & Fenwick, J. (2017). Prevalence of burnout, depression, anxiety and stress in Australian midwives: a cross-sectional survey. *Bmc Pregnancy and Childbirth, 17*. doi:10.1186/s12884-016-1212-5

Cusack, L., Smith, M., Hegney, D., Rees, C. S., Breen, L. J., Witt, R. R., . . . Cheung, K. (2016). Exploring environmental factors in nursing workplaces that promote psychological resilience: constructing a unified theoretical model. *Frontiers in Psychology, 7*, 600.

Delgado, C., Upton, D., Ranse, K., Furness, T., & Foster, K. (2017). Nurses' resilience and the emotional labour of nursing work: An integrative review of empirical literature. *International Journal of Nursing Studies, 70*, 71-88.

Dolan, G., Strodl, E., & Hamernik, E. (2012). Why renal nurses cope so well with their workplace stressors. *Journal of Renal Care, 38*(4), 222-232. doi:https://dx.doi.org/10.1111/j.1755-6686.2012.00319.x

Dorrian, J., Paterson, J., Dawson, D., Pincombe, J., Grech, C., & Rogers, A. E. (2011). Sleep, stress and compensatory behaviors in Australian nurses and midwives. *Revista De Saude Publica, 45*(5), 922-930. doi:10.1590/s0034-89102011005000059

Drury, V., Craigie, M., Francis, K., Aoun, S., & Hegney, D. G. (2014). Compassion satisfaction, compassion fatigue, anxiety, depression and stress in registered

nurses in Australia: Phase 2 results. *Journal of Nursing Management, 22*(4), 519-531. doi:http://dx.doi.org/10.1111/jonm.12168

Earvolino-Ramirez, M. (2007). *Resilience: A concept analysis.* Paper presented at the Nursing Forum.

Foster, K., Shochet, I., Wurfl, A., Roche, M., Maybery, D., Shakespeare-Finch, J., & Furness, T. (2018). On PAR: A feasibility study of the Promoting Adult Resilience programme with mental health nurses. *International Journal of Mental Health Nursing, 27*(5), 1470-1480. doi:10.1111/inm.12447

Foureur, M., Besley, K., Burton, G., Yu, N., & Crisp, J. (2013). Enhancing the resilience of nurses and midwives: Pilot of a mindfulness-based program for increased health, sense of coherence and decreased depression, anxiety and stress. *Contemporary Nurse: A Journal for the Australian Nursing Profession, 45*(1), 114-125. doi:10.5172/conu.2013.45.1.114

Gabrielle, S., Jackson, D., & Mannix, J. (2008). Adjusting to personal and organisational change: views and experiences of female nurses aged 40-60 years. *Collegian: Journal of the Royal College of Nursing, Australia, 15*(3), 85-91.

Gao, F., Newcombe, P., Tilse, C., Wilson, J., & Tuckett, A. (2014). Models for predicting turnover of residential aged care nurses: a structural equation modelling analysis of secondary data. *International Journal of Nursing Studies, 51*(9), 1258-1270. doi:https://dx.doi.org/10.1016/j.ijnurstu.2014.01.011

Garcia-Dia, M. J., DiNapoli, J. M., Garcia-Ona, L., Jakubowski, R., & O'flaherty, D. (2013). Concept analysis: resilience. *Archives of Psychiatric Nursing, 27*(6), 264-270.

Gillespie, B. M., Chaboyer, W., & Wallis, M. (2009). The influence of personal characteristics on the resilience of operating room nurses: A predictor study. *International Journal of Nursing Studies, 46*(7), 968-976. doi:http://dx.doi.org/10.1016/j.ijnurstu.2007.08.006

Guo, Y. F., Plummer, V., Lam, L., Wang, Y., Cross, W., & Zhang, J. P. (2018). The effects of resilience and turnover intention on nurses' burnout: Findings from a comparative cross-sectional study. *Journal of Clinical Nursing*. doi:10.1111/jocn.14637

Hayes, B., Douglas, C., & Bonner, A. (2014). Predicting emotional exhaustion among haemodialysis nurses: a structural equation model using Kanter's structural empowerment theory. *Journal of Advanced Nursing, 70*(12), 2897-2909. doi:https://dx.doi.org/10.1111/jan.12452

Hayes, B., Douglas, C., & Bonner, A. (2015). Work environment, job satisfaction, stress and burnout among haemodialysis nurses. *Journal of Nursing Management, 23*(5), 588-598. doi:https://dx.doi.org/10.1111/jonm.12184

Hegney, D., Craigie, M., Hemsworth, D., Osseiran-Moisson, R., Aoun, S., Francis, K., & Drury, V. (2014). Compassion satisfaction, compassion fatigue, anxiety, depression and stress in registered nurses in Australia: Study 1 results. *Journal of Nursing Management, 22*(4), 506-518. doi:http://dx.doi.org/10.1111/jonm.12160

Hegney, D., Eley, R., Osseiran-Moisson, R., & Francis, K. (2015). Work and personal well-being of nurses in Queensland: Does rurality make a difference? *Australian Journal of Rural Health, 23*(6), 359-365. doi:https://dx.doi.org/10.1111/ajr.12206

Hegney, D., Rees, S., Eley, R., Osseiran-Moisson, R., & Francis, K. (2015). The contribution of individual psychological resilience in determining the professional quality of life of Australian nurses. *Frontiers in Psychology Vol 6 2015, ArtID 1613, 6*.

Holland, P. J., Allen, B. C., & Cooper, B. K. (2013). Reducing burnout in Australian nurses: The role of employee direct voice and managerial responsiveness. *The International Journal of Human Resource Management, 24*(16), 3146-3162. doi:http://dx.doi.org/10.1080/09585192.2013.775032

Hong, N. Q., Pluyr, P., Fabregues, S., Bartlett, G., Boardman, F., Cargo, M., . . . Vedel, I. (2018). *Mixed Methods Appraisal Tool (MMAT)*. Retrieved from Canada.:

Hopia, H., Latvala, E., & Liimatainen, L. (2016). Reviewing the methodology of an integrative review. *Scandinavian journal of caring sciences, 30*(4), 662-669.

Karimi, L., Cheng, C., Bartram, T., Leggat, S. G., & Sarkeshik, S. (2015). The effects of emotional intelligence and stress-related presenteeism on nurses' well-being. *Asia Pacific Journal of Human Resources, 53*(3), 296-310. doi:http://dx.doi.org/10.1111/1744-7941.12049

Karimi, L., Leggat, S. G., Donohue, L., Farrell, G., & Couper, G. E. (2014). Emotional rescue: The role of emotional intelligence and emotional labour on well-being and job-stress among community nurses. *Journal of Advanced Nursing, 70*(1), 176-186. doi:http://dx.doi.org/10.1111/jan.12185

Kim, M., & Windsor, C. (2015). Resilience and work-life balance in first-line nurse manager. *Asian nursing research, 9*(1), 21-27.

Kornhaber, R. A., & Wilson, A. (2011a). Building resilience in burns nurses: a descriptive phenomenological inquiry. *Journal of Burn Care & Research, 32*(4), 481-488. doi:https://dx.doi.org/10.1097/BCR.0b013e3182223c89

Kornhaber, R. A., & Wilson, A. (2011b). Psychosocial needs of burns nurses: a descriptive phenomenological inquiry. *Journal of Burn Care & Research, 32*(2), 286-293. doi:https://dx.doi.org/10.1097/BCR.0b013e31820aaf37

Lim, J., Bogossian, F., & Ahern, K. (2010). Stress and coping in Australian nurses: a systematic review. *International Nursing Review, 57*(1), 22-31. doi:https://dx.doi.org/10.1111/j.1466-7657.2009.00765.x

McDonald, G., Jackson, D., Vickers, M. H., & Wilkes, L. (2016). Surviving workplace adversity: a qualitative study of nurses and midwives and their strategies to increase personal resilience. *Journal of Nursing Management, 24*(1), 123-131. doi:https://dx.doi.org/10.1111/jonm.12293

McDonald, G., Jackson, D., Wilkes, L., & Vickers, M. H. (2013). Personal resilience in nurses and midwives: Effects of a work-based educational intervention. *Contemporary Nurse: A Journal for the Australian Nursing Profession, 45*(1), 134-143. doi:10.5172/conu.2013.45.1.134

McMillan, K., Butow, P., Turner, J., Yates, P., White, K., Lambert, S., . . . Lawsin, C. (2016). Burnout and the provision of psychosocial care amongst Australian cancer nurses. *European Journal of Oncology Nursing, 22*, 37-45. doi:http://dx.doi.org/10.1016/j.ejon.2016.02.007

Mills, J., Woods, C., Harrison, H., Chamberlain-Salaun, J., & Spencer, B. (2017). Retention of early career registered nurses: The influence of self-concept, practice environment and resilience in the first five years post-graduation. *Journal of Research in Nursing, 22*(5), 372-385. doi:http://dx.doi.org/10.1177/1744987117709515

Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med, 6*(7).

Opie, T., Dollard, M., Lenthall, S., Wakerman, J., Dunn, S., Knight, S., & MacLeod, M. (2010). Levels of occupational stress in the remote area nursing workforce. *The Australian Journal of Rural Health, 18*(6), 235-241. doi:http://dx.doi.org/10.1111/j.1440-1584.2010.01161.x

Pearson, A., White, H., Bath-Hextall, F., Apostolo, J., Salmond, S., & Kirkpatrick, P. (2014). Methodology for JBI mixed methods systematic reviews. *The Joanna Briggs Institute Reviewers Manual, 1*, 5-34.

Perry, L., Nicholls, R., Duffield, C., & Gallagher, R. (2017). Building expert agreement on the importance and feasibility of workplace health promotion interventions for nurses and midwives: A modified Delphi consultation. *Journal of Advanced Nursing, 73*(11), 2587-2599. doi:https://dx.doi.org/10.1111/jan.13345

Pisaniello, S. L., Winefield, H. R., & Delfabbro, P. H. (2012). The influence of emotional labour and emotional work on the occupational health and wellbeing of South Australian hospital nurses. *Journal of Vocational Behavior, 80*(3), 579-591. doi:http://dx.doi.org/10.1016/j.jvb.2012.01.015

Rees, C. S., Breen, L. J., Cusack, L., & Hegney, D. (2015). Understanding individual resilience in the workplace: the international collaboration of workforce resilience model. *Frontiers in Psychology, 6*, 73.

Rose, J., & Glass, N. (2008). Enhancing emotional well-being through self-care: the experiences of community health nurses in Australia.[Erratum appears in Holist Nurs Pract. 2009 May-Jun;23(3):182]. *Holistic Nursing Practice, 22*(6), 336-347. doi:https://dx.doi.org/10.1097/01.HNP.0000339345.26500.62

Scoloveno, R. (2016). A concept analysis of the phenomenon of resilience.

Slatyer, S., Craigie, M., Heritage, B., Davis, S., & Rees, C. (2018). Evaluating the effectiveness of a brief mindful self-care and resiliency (MSCR) intervention for nurses: A controlled trial. *Mindfulness, 9*(2), 534-546. doi:http://dx.doi.org/10.1007/s12671-017-0795-x

Slatyer, S., Craigie, M., Rees, C., Davis, S., Dolan, T., & Hegney, D. (2018). Nurse experience of participation in a mindfulness-based self-care and resiliency intervention. *Mindfulness, 9*(2), 610-617. doi:http://dx.doi.org/10.1007/s12671-017-0802-2

Teo, S., Pick, D., Newton, C. J., Yeung, M. E., & Chang, E. (2013). Organisational change stressors and nursing job satisfaction: the mediating effect of coping strategies. *Journal of Nursing Management, 21*(6), 878-887. doi:https://dx.doi.org/10.1111/jonm.12120

Teo, S., Yeung, M., & Chang, E. (2012). Administrative stressors and nursing job outcomes in Australian public and non-profit health care organisations. *Journal of Clinical Nursing, 21*(9-10), 1443-1452. doi:http://dx.doi.org/10.1111/j.1365-2702.2011.03871.x

Tran, D. T., Johnson, M., Fernandez, R., & Jones, S. (2010). A shared care model vs. a patient allocation model of nursing care delivery: Comparing nursing staff satisfaction and stress outcomes. *International Journal of Nursing Practice, 16*(2), 148-158. doi:http://dx.doi.org/10.1111/j.1440-172X.2010.01823.x

Turner, S. B. (2014). The resilient nurse: an emerging concept. *Nurse Leader, 12*(6), 71-90.

Whittemore, R., & Knafl, K. (2005). The integrative review: updated methodology. *Journal of advanced nursing, 52*(5), 546-553.

Yılmaz, E. B. (2017). Resilience as a strategy for struggling against challenges related to the nursing profession. *Chinese Nursing Research, 4*(1), 9-13.

Zander, M., & Hutton, A. (2009). Paediatric oncology nursing: working and coping when kids have cancer -- a thematic review. *Neonatal, Paediatric & Child Health Nursing, 12*(3), 15-27.

Zander, M., Hutton, A., & King, L. (2013). Exploring resilience in paediatric oncology nursing staff. *Collegian: Journal of the Royal College of Nursing, Australia, 20*(1), 17-25.

Table 1 Characteristics of included articles

Included article	Objectives	Target	Gender	Study design	Methods	Data collection instrument	Analysis	Quality score
Abraham et al. (2018)	To describe the ED working environment as perceived by medical and nursing staff working in two different-sized EDs within the same healthcare service.	Workplace Stress	Females & males	Cross-sectional	Quantitative	• Working Environment Scale-10 (WES-10); • The Jalowiec Coping Scale part A (JCS-A); • workplace stressors	Descriptive statistics	High
Allen et al. (2015)	To examine the relationship between bullying and burnout and the potential buffering effect psychological detachment might have on this relationship.	Workplace Stress	Females & males	Cross-sectional	Quantitative	• Scale developed by Quine; • Recovery Experience Questionnaire; • Copenhagen Burnout Inventory (CBI)	Descriptive & inferential	High
Bowden et al. (2015)	To examined sources of work-related stress and reward specific to multidisciplinary staff working in paediatric oncology in Australia.	Workplace Stress	Females & males	Not reported	Quantitative	• Work stressors scale–paediatric oncology	Descriptive & inferential	High
Cameron and Brownie (2010)	To identify the factors that impact the resilience of registered aged care nurses, that is their capacity to adapt to the physical, mental and emotional demands of working in aged care facilities.	Resilience	Females	Interpretive phenomenological	Quantitative	• In-depth interviews	Thematic analysis	High
Cope et al. (2016b)	To explore why nurses chose to remain in the Western Australian workforce and to develop insights into the role of resilience of nurses and to identify the key characteristics of resilience displayed by these nurses.	Resilience	Females	Portraiture	Qualitative	• In-depth interviews	Thematic analysis	High
Cope et al. (2016a)	To explore residential aged care nurses working in interim, rehabilitation and residential aged care perceptions of resilience.	Resilience	Females	Portraiture & Interpretive	Qualitative	• Field notes, memos and gesture drawings interviews	Thematic analysis	High
Craigie et al. (2016)	To evaluate the feasibility of a mindfulness-based intervention aimed at reducing compassion fatigue and improving emotional well-being in nurses	Resilience	Not reported	Quasi-experiments	Quantitative	• Patient Health Questionnaire-9; • Short Screening Scale for DSM-IV PTSD;	Descriptive & inferential statistics	High

						• CAGE questionnaire; • The Demographic Questionnaire; • Professional Quality of Life Scale; Depression Anxiety Stress Scales; • Spiel Berger State-Trait Anxiety Inventory form Y2; • Connor-Davidson Resilience Scale; • Passion for Work Scale		
Creedy et al. (2017)	To investigate the prevalence of burnout, depression, anxiety and stress in Australian midwives	Workplace Stress	Female	Cross sectional	Quantitative	• Copenhagen Burnout Inventory (CBI); • Depression, Anxiety and Stress Scale (DASS)	Descriptive statistics	High
Dolan et al. (2012)	To undertake an inductive process to better understand the stressors and the coping strategies used by renal nurses that may lead to resilience.	Workplace Stress & Resilience	Females & males	Grounded theory	Qualitative	• In-depth interviews • Maslach Burnout Inventory-Human Services Survey (MBI)	Concurrent analysis	High
Dorrian et al. (2011)	To describe sleep, stress and compensatory behaviours in nurses and midwives.	Workplace Stress	Females & males	Not reported	Quantitative	• General health and sleep questionnaires • NASA Task Load Index workload scale	Descriptive & inferential	High
Drury et al. (2014)	To explore the factors impacting upon compassion satisfaction, compassion fatigue, anxiety, depression and stress and to describe the strategies nurses use to build compassion satisfaction into their working lives.	Workplace Stress & Resilience	Not reported	Not reported	Qualitative	• In-depth interviews • Focus Group Discussions	Thematic Analysis	High
Foster et al. (2018)	To evaluate the feasibility of a workplace resilience education programme for nurses in high-acuity adult mental health settings.	Resilience	Females & males	Not reported	Quantitative	• Questionnaire (Depression, Anxiety and Stress21 scale)	Descriptive & inferential	High
Foureur et al. (2013)	To pilot the effectiveness of an adapted mindfulness-based stress reduction intervention on the psychological wellbeing of nurses and midwives.	Resilience	Females & males	Quasi-experiments	Mixed methods	• Short form of the GHQ-12 • SOC – Orientation to Life • DASS • Log of MBSR practice	Descriptive & Inferential statistics &	High

						• FGDs & In-depth interviews	content analysis	
Gabrielle et al. (2008)	To explore the views and experiences of female registered nurses aged 40—60 years, in acute hospital and community health care settings	Workplace Stress	Females	Narrative-based	Qualitative	• Conversational-style semi-structured in-depth interviews	thematic Analysis	High
Gao et al. (2014)	To examine the structural relationships among job demands, coping resources, psychological health and turnover of residential aged care nurses	Workplace Stress	Females & males	Not reported	Quantitative	• Job Content Questionnaire (JCQ: • Psychological health domains of SF-36	Descriptive & Inferential	High
Gillespie, Chaboyer, and Wallis (2009)	To identify the level of resilience, and investigate whether age, experience and education contribute to resilience in an Australian sample of OR nurses	Resilience	Females & males	Not reported	Quantitative	• Connor–Davidson Resilience Scale (CD-RISC) • Connor–Davidson Resilience Scale	Descriptive & Inferential	High
Guo et al. (2018)	To examine the differences in burnout, resilience and turnover intention in Australian and Chinese nurses and explore the different effect of resilience and turnover intention on burnout between nurses from the two countries.	Resilience	Females & males	Cross-sectional	Quantitative	• social-demographic questionnaire • MBI-GS and CD-RISC	Descriptive & Inferential	High
Hayes, Douglas, and Bonner (2014)	To test an explanatory model of the relationships between the nursing work environment, job satisfaction, job stress and emotional exhaustion for haemodialysis nurses, drawing on Kanter's theory of organisational empowerment.	Workplace Stress	Females & males	Cross-sectional	Quantitative	• Brisbane Practice Environment Measure (B-PEM) • Index for Work Satisfaction • Nursing Stress Scale (NSS) • Maslach Burnout Inventory (MBI)	Descriptive & Inferential	High
Hayes et al. (2015)	To examine the relationships among nurse and work characteristics, job satisfaction, stress, burnout and the work environment of haemodialysis nurses.	Workplace Stress	Females & males	Cross-sectional	Quantitative	• Brisbane Practice Environment Scale (B-PEM • Index for Work Satisfaction • Nursing Stress Scale (NSS; • Maslach Burnout Inventory (MBI)	Descriptive & Inferential	High
Hegney, Eley, et al. (2015)	To ascertain if differences exist in the perception of the professional practice environment and personal	Workplace Stress	Females & males	Not reported	Quantitative	• Depression, Anxiety and Stress Scale (DASS21)	Descriptive & Inferential	High

	well-being of nurses across different geographical areas in Queensland.					• Professional Quality of Life Scale version 5 (ProQoL5) • Connor–Davidson Resilience Scale (CDRISC25) • Practice Environment Scale – Nursing Work Index Revised (PES-NWI (R)		
Hegney et al. (2014)	To explore compassion fatigue and compassion satisfaction with the potential contributing factors of anxiety, depression and stress.	Workplace Stress	Females & males	Cross-sectional	Quantitative	• Demographic and professional data • Professional Quality of Life Scale version 5 (PROQOL5) • Depression Anxiety Stress Scale (DASS 21-short form) • Depression Anxiety Stress Scales (DASS)	Descriptive & Inferential	High
Hegney, Rees, et al. (2015)	To determine the relative contribution of trait negative affect and individual psychological resilience in explaining the professional quality of life of nurses.	Resilience	Females & males	Cross-sectional	Quantitative	• Depression, Anxiety, and Stress Scale (DASS • Spiel Berger State-Trait Anxiety Inventory form Y2 (STAI-Y2 • Professional Quality of Life Scale version 5 (ProQoL5 • Connor-Davidson Resilience Scale (CD-RISC25	Descriptive & Inferential	High
Holland et al. (2013)	To examine the significance of employee voice and managerial responsiveness in reducing the levels of burnout experienced by nurses.	Workplace Stress	Females & males	Not reported	Quantitative	• Copenhagen Burnout Inventory • Questionnaire for managerial responsiveness to employee needs	Descriptive & Inferential	High
Karimi et al. (2015)	To examine the direct and moderating effects of emotional intelligence on the presenteeism and well-being relationship.	Resilience	Females & males	Cross-sectional	Quantitative	• Self-Report Emotional Intelligence Test (SREIT) • General Well-being Questionnaire (GWBQ) • self-report scale	Descriptive & Inferential	High

Karimi et al. (2014)	To investigate the extent to which emotional labour and emotional intelligence are associated with well-being and job-stress among a group of Australian community nurses.	Workplace Stress	Females & males	Cross-sectional	Quantitative	• Self-report questionnaire to capture • Self-Report Emotional Intelligence Test (SREIT) • Emotional Dissonance (ED) • Job-stress • General Well-being Questionnaire (GWBQ)	Descriptive & Inferential	High
Kornhaber and Wilson (2011a)	To explore the concept of building resilience as a strategy for responding to adversity experienced by burns nurses	Resilience	Females	Interpretive phenomenological	Qualitative	• In-depth interviews	Thematic Analysis	High
Kornhaber and Wilson (2011b)	To explore the psychosocial needs of nurses who care for patients with severe burn injuries	Resilience	Females	Interpretive phenomenological	Qualitative	• In-depth interviews	Thematic Analysis	High
McDonald et al. (2016)	To explore the experiences of Australian nurses and midwives who perceived themselves as resilient.	Resilience	Females	Case study	Qualitative	• workshops and mentoring, • In-depth interviews	Thematic analysis	High
McDonald et al. (2013)	To report the effects of a work-based, educational intervention to promote personal resilience in a group of nurses and midwives working in a busy clinical environment	Resilience	Females	Case study	Qualitative	• In-depth interviews	Thematic analysis	High
McMillan et al. (2016)	To provide a better understanding of the factors influencing burnout amongst Australian cancer nurses in order to improve training and work environments to encourage nurse retention and ultimately improve patient care.	Workplace Stress	Females & males	Not reported	Quantitative	• Areas of Work life Survey (AWLS	Descriptive & Inferential	High
Mills et al. (2017)	To investigate nurse self-concept, practice environment and resilience, and how these three factors influence the retention of early career registered nurses (ECRNs)	Resilience	Females & males	Cross-sectional	Quantitative	• Nurse Self-Concept Questionnaire • Practice Environment Scale of the Nursing Work Index, • Connor–Davidson Resilience Scale • Nurse Retention Index	Descriptive & Inferential	High

Opie et al. (2010)	To identify key workplace demands and resources for nurses working in very remote Australia and measure levels of occupational stress in this population.	Workplace Stress	Females & males	Cross-sectional	Quantitative	• Job Demands Scale • General Health Questionnaire-12 • Burnout Inventory (MBI) • Work Engagement Scale-9 • Job satisfaction	Descriptive & Inferential	Medium
Perry et al. (2017)	To use a Delphi panel to determine the relative importance and feasibility of workplace health promotion interventions to promote and support the health of the Australian nursing and midwifery workforce.	Resilience	Not reported	Modified Delphi design	Mixed methods	• Delphi questionnaire	Descriptive and Thematic analysis	High
Pisaniello et al. (2012)	To investigate the relationship between emotional labour and emotional work on psychological wellbeing and occupational stress in 239 nurses sampled from a South Australian hospital.	Workplace Stress	Not reported	Not reported	Quantitative	• State-Trait Anxiety scale • Work and Family Demands scale • Multidimensional Work–Family Spillover scale • Multi-Dimensional Support scale • Emotional Labour scale • Emotion Work Requirements scale • Emotional Work Inventory • Nursing Stress Index • Copenhagen Burnout Inventory • Job Satisfaction scale	Descriptive & Inferential	High
Rose and Glass (2008)	To explore the subjective experiences of 15 Australian community nurses who provided palliative care to clients and their families living at home.	Resilience	Females	Emancipatory	Qualitative	• In-depth interviews/storytelling and reflective journaling.	Critical analysis process	High
Slatyer, Craigie, Heritage, et al. (2018)	To trial the effectiveness of a brief mindful self-care and resiliency intervention for nurses working in an Australian tertiary hospital compared to nurses in a wait list control condition	Resilience	Females & males	Wait list control trial	Quantitative	• Questionnaires	Descriptive & Inferential	High

Slatyer, Craigie, Rees, et al. (2018)	To explore nurses' responses to the MSCR program including its perceived feasibility, acceptability, and applicability	Resilience	Females	descriptive design	Qualitative	• In-depth interviews	thematic analysis	High
Teo et al. (2013)	To examine the mediating effect of coping strategies on the consequences of nursing and non-nursing (administrative) stressors on the job satisfaction of nurses during change management.	Workplace Stress	Females & males	two-wave panel design	Quantitative	• non-nursing, administrative stressors scale • Role stress is operationalised as a reflective scale • Nursing Stress Scale • Chang and Hancock • intrinsic and extrinsic job satisfaction	Descriptive & Inferential	High
Teo et al. (2012)	To develop a path model to examine the effect of administrative stressors on nursing work outcomes in a sample of Australian public and non-profit nurses.	Workplace Stress	Females & males	Not reported	Quantitative	• self-completion questionnaire • Administrative stressors • work-related social support • non-work-related social support • GHQ-12 scale • Job satisfaction • Organisational commitment	Descriptive & Inferential	High
Tran et al. (2010)	To compare nurse outcomes between the shared care in nursing (SCN) and patient allocation (PA) models of care.	Workplace Stress	Females & males	Quasi-experimental	Quantitative	• Job Descriptive Index (JDI) • Stress in General (SIG) scale • Tension Index by Lyons • Role conflict and ambiguity scales	Descriptive & Inferential	High
Zander et al. (2013)	To explore the concept of resilience among paediatric oncology nurses who work at the bedside, and the process these nurses underwent in order to develop resilience	Resilience	Females	Case study	Qualitative	• In-depth interviews	Thematic analysis	High

Table 2 Themes

Themes	Sub-themes	N	Papers
Levels of stress among workplace nurses	Stress level	19	(Abraham et al., 2018) (Bowden et al., 2015) (Dolan et al., 2012) (Karimi et al., 2015) (Karimi et al., 2014) (Opie et al., 2010) (Teo et al., 2013) (Teo et al., 2012) (Rose & Glass, 2008) (Slatyer, Craigie, Rees, et al., 2018) (Dorrian et al., 2011) (Hayes et al., 2015) (Hegney et al., 2014) (Hegney, Eley, et al., 2015) (Tran et al., 2010) (Drury et al., 2014) (Gabrielle et al., 2008) (Hegney, Rees, et al., 2015) (Creedy et al., 2017)
Causative factor of stress for nurses	Workplace bullying	3	(Dolan et al., 2012) (Gabrielle et al., 2008) (Allen et al., 2015)
Impacts and outcomes of stress	Burnout	10	(Allen et al., 2015) (Creedy et al., 2017) (Dolan et al., 2012) (Hayes et al., 2015) (Hegney, Eley, et al., 2015) (Holland et al., 2013) (McMillan et al., 2016) (Guo et al., 2018) (Hegney, Rees, et al., 2015) (Kornhaber & Wilson, 2011b)
	Psychological distress	10	(Allen et al., 2015) (Gabrielle et al., 2008) (Gao et al., 2014) (Hayes et al., 2015) (Karimi et al., 2014) (Opie et al., 2010) (Pisaniello et al., 2012) (Kornhaber & Wilson, 2011a) (McDonald et al., 2016) (Rose & Glass, 2008)
	Depression and anxiety	4	(Creedy et al., 2017) (Hegney, Rees, et al., 2015) (Drury et al., 2014) (Hegney et al., 2014)
Levels of resilience among workplace nurses	Resilience level	13	(Dolan et al., 2012) (Hegney, Eley, et al., 2015) (Guo et al., 2018) (Hegney, Rees, et al., 2015) (Cameron & Brownie, 2010) (Mills et al., 2017) (Cope et al., 2016a) (Kornhaber & Wilson, 2011a) (Cope et al., 2016b) (Slatyer, Craigie, Rees, et al., 2018) (Guo et al., 2018) (Rose & Glass, 2008) (Gabrielle et al., 2008)
Individual attributes used to build resilience	Organising work as mindful strategy	7	(Dolan et al., 2012) (Gabrielle et al., 2008) (Gao et al., 2014) (McDonald et al., 2016) (McDonald et al., 2013) (Perry et al., 2017) (Cameron & Brownie, 2010)
	Work–life balance as mindful strategy	6	(Cope et al., 2016b) (Cope et al., 2016a) (Kornhaber & Wilson, 2011a) (McDonald et al., 2013) (Rose & Glass, 2008) (Cameron & Brownie, 2010)
	Self-reliance mechanism	9	(Dolan et al., 2012) (Cope et al., 2016a) (Cope et al., 2016b) (Kornhaber & Wilson, 2011a) (McDonald et al., 2016) (McDonald et al., 2013) (Rose & Glass, 2008) (Cameron & Brownie, 2010) (Slatyer, Craigie, Rees, et al., 2018)
	Learning as self-efficacy strategy	6	(Drury et al., 2014) (Cope et al., 2016a) (Cope et al., 2016b) (McDonald et al., 2013) (Slatyer, Craigie, Rees, et al., 2018) (Cameron & Brownie, 2010)
	Positive thinking	4	(Abraham et al., 2018) (Cope et al., 2016a) (Cope et al., 2016b) (Kornhaber & Wilson, 2011a) (Cameron & Brownie, 2010)

	Emotional intelligence as self-efficacy strategy	5	(Dolan et al., 2012) (Karimi et al., 2015) (Karimi et al., 2014) (Kornhaber & Wilson, 2011a) (McDonald et al., 2013)
	Passion and interest	2	(Cope et al., 2016b) (Cope et al., 2016a)
Resilience intervention	Workplace resilience intervention	6	(Foster et al., 2018) (Craigie et al., 2016) (McDonald et al., 2013) (Foureur et al., 2013) (Slatyer, Craigie, Heritage, et al., 2018) (Slatyer, Craigie, Rees, et al., 2018)
	Effectiveness of resilience interventions	5	
Organisational resources used to build resilience	Informal support services	9	(Cope et al., 2016b) (McDonald et al., 2016) (Kornhaber & Wilson, 2011b) (McDonald et al., 2013) (Cameron & Brownie, 2010) (Rose & Glass, 2008) (Drury et al., 2014) (Slatyer, Craigie, Rees, et al., 2018) (Cope et al., 2016a)
	Formal support services	4	(Drury et al., 2014) (Perry et al., 2017) (Teo et al., 2012) (Kornhaber & Wilson, 2011b)
	Leadership	3	(Drury et al., 2014) (Cope et al., 2016b) (Perry et al., 2017)
	Role modelling	2	(Drury et al., 2014) (Cope et al., 2016b)

Table 3 Intervention studies on workplace resilience

Paper	Intervention	Objective of intervention	Mode of delivering	Content of intervention	Resilience	Outcome
Slatyer, Craigie, Heritage, et al. (2018)	Mindful Self-care and Resiliency (MSCR) interventions	To learn mindfulness-based skills and practices to support CF resiliency.	• a full-day educational workshop comprising four sessions • A daily or weekly mindfulness practice assigned as home-based exercises using a CD	• The workshop focused on compassion fatigue resiliency and mindfulness concepts	Individual resilience	The MSCR program had significant reductions in burnout and depression scores as well as improved levels of compassion satisfaction, self-compassion and subjective quality of life

Slatyer, Craigie, Rees, et al. (2018)	Mindful Self-care and Resiliency (MSCR) interventions	To learn mindfulness to support resiliency skills	• a one-day educational workshop • Followed immediately by a series of weekly mindfulness skills seminars conducted over a period of 4 weeks.	• The workshop focused on compassion fatigue resiliency and introduction to mindfulness	Individual resilience	The MSCR program was feasible and acceptable, particularly developing feelings of inner calm and self-care strategies
Craigie et al. (2016)	Mindful Self-care and Resiliency (MSCR) interventions	To learn mindfulness to support Compassion fatigue resiliency skills	• a 1-day educational workshop • Followed immediately by a series of weekly mindfulness skills	• The workshop focused on compassion fatigue resiliency and introduction to mindfulness	Individual resilience	There were significant improvements across a number of symptom domains following the MSCR intervention
Foster et al. (2018)	Promoting Adult Resilience program	To promote adults' resilience, increase their mental health and well-being, improve relationships and decrease conflict by increasing interpersonal and communication	• Two full-day workshops on PAR modules was delivered face to face for 3 weeks by two trained facilitators in a peer group setting. • Two email boosters in-between sessions and one email per month for 3 months following the final session were sent to participants	• PAR comprises seven modules and additional adapted component (identifying strengths and understanding resilience, understanding and managing stress, challenging and changing negative self-talk, drawing strength from adversity and	Individual resilience	There were significant positive effects of PAR on mental health, well-being, and workplace resilience

		skills, and decrease stress by promoting stress management skills		promoting positive relationships)		
McDonald et al. (2013)	work-based educational intervention	a work-based, educational intervention to promote personal resilience in a group of nurses and midwives working in a busy clinical environment	• Six resilience workshops and a mentoring programme conducted over a 6 month period	• Each workshop was developed around two of the following characteristics associated with resilience: positive and nurturing relationships and networks; mentoring; positive outlook; hardiness; intellectual flexibility; emotional intelligence; life balance; spirituality; reflection; critical thinking and therapeutic element	Individual resilience	Resilience reported are self-confidence, self-awareness, self-care and assertive communication. Enhancing personal resilience may indeed assist in protecting nurses and midwives against the serious effects of workplace adversity
Foureur et al. (2013)	a program based on mindfulness-based stress reduction	to provide information and introductory practice in MBSR and to support participants with practical strategies to embrace mindfulness	• one-day, MBSR workshop involving mindfulness-based stress reduction taught by an experienced psychologist (GB) • a CD recorded by the primary workshop facilitator for daily mindfulness practice	• The workshop was divided into a component (introduction to the research and workshop, the impact of stress on being in the present moment, an introduction to mindfulness, grounding and	Individual resilience	The findings related to the acceptability and feasibility of the intervention – both participation in the workshop and integration of regular meditation practice

		practice on a daily basis	sessions of 20 minutes for an 8 week period	defusion strategies and Forming habits)		

Figure 1 legends: Flow chart of included papers

Appendix 1 Data extraction form

Study ID	
Study Details	
Citation	
Year of publication(s)	
Author(s)	
Contact details of lead author	
Funder / sponsoring organisation	
Publication type Example: • Journal article • Report (specify) • Case study • Other	
Publication Source	
Methodology (if applicable) • Study design	
• Type of data	
• Data collection	
• Sampling	
• Data analysis	
• Participants/No. of studies included	
Population	
Nurses • Please specify the category of Nurses?	
Age range	
Sex	
Study setting	
Objective of the study	
Subject area The paper may focus on one or more sectors ie • Nurses workplace stress • Impact of stress • Concept of resilience • Antecedents to resilience • Impact of resilience on nurses workplace stress	
Nurses workplace stress	**Please identify the existing evidence on stress faced by nurses at work?**
Impact of nurses workplace stress	**Please describe the impact of stress faced by nurses at work a) at an individual level, in terms of nurse mental health, absenteeism, turnover b) at a team level**

Concept of Resilience	**Please specify the concept of nursing resilience at individual level and team level?**
Antecedents to resilience	**Please specify the antecedents to nurses' resilience?**
Impact of resilience on nurses workplace stress	**Please describe the role of resilience in mitigating the negative consequences of workplace stress on nurses (individuals and teams)**
Any existing interventions	
Outcome of intervention	
Please report on any additional information nurses workplace stress and resilience	
Recommendation	
Identifiable references to follow up	

Appendix 2 Methodological Quality assessment Criteria

Reviewer 1				
Reviewer 2				
Author (s)				
Methods				
Study design				
Data				
Sampling				
Analysis				
Types of Study	**Methodological Quality assessment Criteria**	**Yes**	**No**	**Cant tell**
Screening Questions (for all types)	Are there clear research questions or objectives?	☐	☐	☐
	Do the collected data address the research question?	☐	☐	☐
	Further appraisal is not feasible when the answer is 'No' or 'Can't tell' to one or both screening questions			
Qualitative	1.1 Is there congruity between the stated philosophical perspective and the research methodology?	☐	☐	☐
	1.2 Are the sources of qualitative data (archives, documents, informants, observations) relevant to address the research question?	☐	☐	☐
	1.3 Is the process for analysing qualitative data relevant to address the research question?	☐	☐	☐
	1.4 Are participants, and their voices, adequately represented? (adequate quotes and text been used to represent the concept discussed)	☐	☐	☐
	1.5 Is there a statement locating the researcher culturally or theoretically? (Are the beliefs and values, and their potential influence on the study declared?)	☐	☐	☐
	1.6. Is the influence of the researcher on the research, and vice-versa, addressed? *(Addressing the potential for the researcher to either influence or to be influenced by the study)*	☐	☐	☐
	1.7. Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?	☐	☐	☐
	1.8. Is the ethical issues adequately addressed? *(statement indicating appropriate ethics approval)*	☐	☐	☐
Quantitative randomized controlled (trials)	2.1. Is there a clear description of the randomization (or an appropriate sequence generation)?	☐	☐	☐
	2.2. Is there a clear description of the allocation concealment or blinding when applicable)?	☐	☐	☐
	2.3. Are there complete outcome data (80% or above)?	☐	☐	☐
	2.4. Is there low withdrawal/drop-out (below 20%)?	☐	☐	☐
Quantitative non-randomized **(Cohort study, case-control study, analytical cross-sectional)**	3.1. Are participants recruited in a way that minimizes selection bias?	☐	☐	☒
	3.2 Were the criteria for inclusion in the sample clearly defined?	☐	☐	☐
	3.3 Were the study subjects and the setting described in detail?	☐	☐	☐
	3.4 Were objective, standard criteria used for measurement of the condition?	☐	☐	☐
	3.5 Were the outcomes measured in a valid and reliable way?	☐	☐	☐
	3.6 Was appropriate statistical analysis used?	☐	☐	☐
	3.7 Is the ethical issues adequately addressed? (statement indicating appropriate ethics approval)	☐	☐	☐
	3.8 Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?	☐	☐	☐
	3.9 Are measurements appropriate (clear origin, or validity known, or standard instrument; and absence of contamination between	☐	☐	☐

	groups when appropriate) regarding the exposure/intervention and outcomes?			
	3.11 In the groups being compared (exposed vs. non-exposed; with intervention vs. without; cases vs. controls), are the participants comparable, or do researchers take into account (control for) the difference between these groups?	☐	☒	☐
	3.12 Are there complete outcome data (80% or above), and, when applicable, an acceptable response rate (60% or above), or an acceptable follow-up rate for cohort studies (depending on the duration of follow-up)?	☐	☐	☐
Quantitative descriptive	4.1. Is the sampling strategy relevant to address the quantitative research question (quantitative aspect of the mixed methods question)?	☐	☐	☐
	4.2. Is the sample representative of the population understudy?	☐	☐	☐
	4.3. Are measurements appropriate (clear origin, or validity known, or standard instrument)?	☐	☐	☐
	4.4. Is there an acceptable response rate (60% or above)?	☐	☐	☐
Systematic Review	5.1 Is the review question clearly and explicitly stated?	☐	☐	☐
	5.2 Were the inclusion criteria appropriate for the review question?	☐	☐	☐
	5.3 Was the search strategy appropriate?	☐	☐	☐
	5.4 Were the sources and resources used to search for studies adequate?	☐	☐	☐
	Were the criteria for appraising studies appropriate?	☐	☐	☐
	5.5 Was critical appraisal conducted by two or more reviewers independently?	☐	☐	☐
	5.6 Were there methods to minimize errors in data extraction?	☐	☐	☐
	5.7 Were the methods used to combine studies appropriate?	☐	☐	☐
	5.8 Was the likelihood of publication bias assessed?	☐	☐	☐
	5.9 Were recommendations for policy and/or practice supported by the reported data?	☐	☐	☐
	5.10 Were the specific directives for new research appropriate?	☐	☐	☐
Mixed methods	6.1. Is the mixed methods research design relevant to address the qualitative and quantitative research questions, or the qualitative and quantitative aspects of the mixed methods question?	☐	☐	☐
	6.2. Is the integration of qualitative and quantitative data (or results relevant to address the research question?	☐	☐	☐
	6.3. Is appropriate consideration given to the limitations associated with this integration, e.g., the divergence of qualitative and quantitative data in a triangulation design?	☐	☐	☐
	Apply the criteria use for qualitative data for the qualitative component and quantitative component respectively.			
Overall Quality Score	*Comments on score:*	☐ Low (25%) ☐ Medium (50%) ☐ High 70% - 100%		
Reviewer 2	*Comments:*			

NB: Scoring metrics

The score can be computed by counting the total number of "yes" and expressing them as a percentage ie below 25% represent Low Quality, 50% represent Medium Quality, and 70% and above represent high Quality.