Compassion satisfaction, resilience, and passion for work among nurses and physicians working in intensive care units: A mixed method systematic review

Abstract

Objective: To identify, appraise, and synthesise current evidence on prevalence, correlates, and interventions to enhance compassion satisfaction, resilience, and passion for work among nurses and physicians working in intensive care units.

Methods: A mixed methods systematic review was conducted. The comprehensive search used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. Seven databases (MEDLINE, EMBASE, CINAHL, JBI, ProQuest, PsycINFO, and Cochrane Library) were searched for literature published between January 2011 and June 2021. The Mixed Methods Appraisal Tool was used to assess methodological quality. Data from included studies were analysed using a convergent mixed methods design. The protocol was prospectively registered (PROSPERO 2021 CRD42021252051).

Results: A total of 37 studies met the inclusion criteria. Most studies reported moderate levels of compassion satisfaction among ICU health professionals, whereas levels of resilience varied. Compassion satisfaction and resilience were positively correlated, but relationships between compassion satisfaction and resilience and other correlates (personal factors, psychological factors, and work-related factors) were inconsistently reported. Only four interventions aimed to improve compassion satisfaction or resilience among ICU health professionals. None of the included studies investigated passion for work.
Conclusion: Compassion satisfaction, resilience, and passion for work among staff in ICU are important in the current global COVID-19 pandemic. Health professionals report a moderate level of compassion satisfaction but findings in relation to resilience are mixed. No studies examined passion for work. Further research to determine ongoing psychological wellbeing and professional quality of life and evaluate tailored interventions to support ICU staff well-being is recommended.

Keywords: Intensive Care Unit, Systematic Review, Health Care Professional, Compassion Satisfaction, Psychological Resilience, Passion

Implications for Nursing Practice

• Critical care nurses have moderate levels of compassion satisfaction, but findings regarding resilience remain unclear. Therefore, hospital administrators should develop positive psychological interventions for critical care nurses to promote compassion satisfaction and resilience.

• Despite inconsistencies across studies, personal characteristics were identified as important correlates of compassion satisfaction and resilience among critical care nurses. Senior and experienced nurses had higher compassion satisfaction and nurse managers can harness this valuable resource to promote and build compassion satisfaction among the wider team.

• Compassion satisfaction was associated with job-related factors, caring ability and nursing competence, despite inconsistent findings in the included studies. Thus, clinical leaders should promote effective nursing care, encourage collaboration, and value staff through meaningful recognition.

Introduction
Caring for patients and supporting families in intensive care units (ICUs) can be stressful and challenging for health care professionals (HCPs). ICU nurses and physicians are exposed to higher levels of occupational stress compared with staff in other healthcare settings (Babanataj et al., 2019; Kumar et al., 2016; Van Mol et al., 2015; Vahedian-Azimi et al., 2019). Multiple professional and psychological challenges are regularly faced by ICU staff including emotional stress, conflict with other staff (Akinwolere, 2016; Van Mol et al., 2015), high workloads (Akinwolere, 2016; Sarafis et al., 2016; Vahedian-Azimi et al., 2019), and caring for dying patients (Akinwolere, 2016; Sarafis et al., 2016).

ICU environments can affect healthcare professionals’ psychological well-being, quality of life, quality of care, and staff turnover (Sarafis et al., 2016; Stamm, 2010; Yılmaz, 2017). The COVID-19 pandemic has further exacerbated pre-existing stresses, with significant increases in psychological distress reported among ICU staff due to extreme workloads, elevated risk of workplace-acquired infection, and lack of essential equipment needed to provide care and protect their own health (Da Silva and Barbosa, 2021). These factors contribute to worse short- and longer-term outcomes for HCPs including burnout, compassion fatigue, depression, anxiety, and insomnia (Cavanagh et al., 2020; Da Silva and Barbosa, 2021; Zhang et al., 2020).

Traditionally, research regarding ICU staff has focused on the negative psychological impacts of working in this highly stressful clinical setting. More recently, however, attention has turned to positive psychological factors that enable staff to maintain well-being and continue to work and thrive despite contextual challenges. Emerging evidence suggests that increasing compassion satisfaction and resilience may
help promote psychological well-being, decrease secondary traumatic stress, and support retention of ICU nurses (Ata et al., 2020; Jakimowicz et al., 2018).

Stamm’s conceptual model of professional quality of life refers to the positive feelings that individuals derive from helping or caring for those who are suffering, or “compassion satisfaction” (Stamm, 2010; Okoli et al., 2020). Although Stamm (2010) highlighted personal and environmental elements that impact professional quality of life there has been relatively little attention given to resilience and passion for work. Resilience refers to a person’s capability to adapt and cope in the face of adversity (Connor and Davidson, 2003). Increasing nurses’ resilience can help to decrease emotional exhaustion, increase work engagement, and enhance functioning when dealing with work-related stress (Hart et al., 2014; Yu et al., 2019). Similarly, passion for work influences work satisfaction, engagement, intrinsic motivation, and sense of belonging (Gkorezis et al., 2021; Purba and Ananta, 2018; Špehar et al., 2016). Passion is defined as the tendency to engage in activities that an individual enjoys and strongly believes are essential (Špehar et al., 2016).

In the current global COVID-19 pandemic, it is more important than ever to understand the positive factors that protect the psychological wellbeing of ICU staff. This review aims to identify, appraise, and synthesise current evidence regarding the prevalence, correlates, and interventions to enhance compassion satisfaction, resilience, and passion for work among ICU healthcare professionals. The following research questions underpin the review:

1. What is the prevalence or level of compassion satisfaction, resilience, and passion for work among nurses and physicians in ICU?
2. What factors are associated with compassion satisfaction, resilience, and passion for work among nurses and physicians in ICU?

3. What is the efficacy of interventions designed to promote compassion satisfaction, resilience, and/or passion for work among nurses and physicians in ICU?

**Methods**

**Protocol**

The protocol was prospectively registered (PROSPERO 2021 CRD42021252051).

**Eligibility criteria**

Inclusion and exclusion criteria are summarised in Table 1. This review considered all primary research using any study design, published between January 2011 and June 2021 to capture recent evidence and because compassion satisfaction within Stamm’s Professional Quality of Life theoretical framework was first described in 2010. Studies with mixed samples that also included medical/nursing students, other health workers, or nurses/physicians working in paediatric, neonatal, or infant ICUs were excluded unless data for adult ICU nurses and/or physicians were reported separately. This review considered studies that examined the prevalence, correlates, or interventions associated with compassion satisfaction, resilience, or passion for work (primary outcomes). Studies that tested interventions to reduce psychological distress (e.g., compassion fatigue, burnout) were excluded unless they also examined effects on one or more primary outcomes.

**Table 1.** Inclusion and exclusion criteria.

<table>
<thead>
<tr>
<th>Inclusion criteria</th>
<th>Exclusion criteria</th>
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<tr>
<td>General criteria</td>
<td>Published 2011–2021; English language; published in a peer-reviewed journal</td>
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<tr>
<td>Population</td>
<td>All nurses or physicians</td>
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<td>Exposure</td>
<td>Adult ICU</td>
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<td>Outcomes</td>
<td>Reported prevalence or correlates or interventions associated with compassion satisfaction or resilience or passion for work</td>
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<tr>
<td>Type of studies</td>
<td>Any study type and design of primary research (qualitative, quantitative, mixed methods)</td>
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</table>

**Information sources and search strategy**

A comprehensive search was performed using seven electronic databases: MEDLINE, EMBASE, CINAHL Complete, Joanna Briggs Institute (JBI), ProQuest, PsycINFO, and Cochrane Library. An experienced librarian and the research team collaborated to identify relevant search terms and refine the search strategy. Search terms included: (nurs* OR doctor* OR physician* OR “health care provider*” OR "health
professional*” OR clinician* OR “health practitioner*”) AND (“intensive care” OR ICU* OR “critical care” OR CCU* OR “coronary care”) AND (“compassion fatigue” OR “secondary traumatic stress” OR burnout OR “compassion satisfaction” OR resilience OR resiliency OR resilient OR strengths OR coping OR hardiness OR adaptation OR “passion for work”). For identification of other relevant articles, a manual search via Google Scholar and hand-searching reference lists of eligible articles was performed.

Study selection

Following removal of duplicates, title and abstract screening for the full search yield was undertaken independently by two authors (SU, EMF). Full texts of studies deemed potentially eligible by one or both reviewers were read independently by two authors (SU, EMF) and summarised in discussion to identify eligibility, with a third author (AEM) adjudicating in cases of disagreement, and discussions continued until consensus was reached on the final set of papers for inclusion.

Data extraction and synthesis

Data extracted included author/s, year, country, study design, aim, sample, setting, methods, intervention (if relevant), and relevant findings. This review was undertaken using a convergent synthesis design (Hong et al., 2017), whereby quantitative and qualitative data were analysed separately and then both results were combined.

Results

Search results

The review process is illustrated in Figure 1. The database search yielded 3320 studies (see Appendix 1): 1137 duplicates were removed, and 2183 titles and abstracts were screened. Of these, 2131 were ineligible (see Figure 1), leaving 52 for full-text review, of which 34 studies were eligible for inclusion. A further seven studies were
identified via other methods (see Figure 1): four were ineligible, and three were eligible giving a total of 37 studies included in the review.

**Figure 1.** Flow diagram of the systematic review process. An adapted PRISMA 2020 flow diagram for new systematic reviews which include searches of databases, registers, and other sources (Page et al., 2021).

*Characteristics of the included studies*

A detailed description of included studies is provided in Table 2. Most (n = 34) used quantitative methods (cross-sectional studies, n = 29; randomised controlled trials, n = 3; quasi-experimental, n = 1; prospective cohort, n = 1). Only three used qualitative methods (ethnography or grounded theory). Almost half the studies (n = 18) were conducted in the United States with the remainder from Iran (n = 4); Canada, Australia, Turkey, China (n = 2); and Jordan, Spain, South Africa, United Kingdom, Malaysia, South Korea, and New Zealand. Most studies (n = 34) were undertaken with nurses only (one study with physicians only, and two with a mix of healthcare workers). Studies were conducted in an academic or tertiary hospital setting (n = 18) or multi-site hospitals or
community hospital settings (n = 16). Most (29/37) were specifically conducted in ICU (combined units, e.g., ICU and high dependency/step-down, n = 8). Response rates varied between 18%-95%.

Twenty-two quantitative studies measured compassion satisfaction, all using the Professional Quality of Life (ProQoL) measure (Stamm, 2010), and eleven measured resilience, using the Connor-Davidson Resilience Scale (CD-RISC; n = 10) or the Resilience Scale for Adults (RSA). Only one study measured both compassion satisfaction and resilience, and none measured passion for work. Three qualitative studies explored compassion satisfaction from nurses’ perspectives (Jakimowicz et al., 2018), resilience in the face of workplace adversity (Jackson et al., 2018), and characteristics and behaviours of highly resilient nurses (Mealer et al., 2012).

Table 2. Description of included studies (n = 37).

<table>
<thead>
<tr>
<th>Reference, Country</th>
<th>Aim</th>
<th>Design, method, instrument</th>
<th>Sample, Setting</th>
<th>Relevant findings</th>
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<tbody>
<tr>
<td><strong>Quantitative Randomised Controlled Trials (n=3)</strong></td>
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<tr>
<td>Kharatzadeh et al., 2020 (Iran)</td>
<td>Investigate the effectiveness of emotional regulation training (ERT) on professional quality of life (CS, burnout, compassion fatigue), depression, anxiety, and stress</td>
<td>Randomised controlled trial, survey, ProQoL 5</td>
<td>60 ICU nurses (treatment group; 30, control group; 30)</td>
<td>- Single university hospital - Significant increase in CS for the intervention group compared to the waitlist-control group at post-intervention (medium effect size).</td>
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<tr>
<td>Mealer et al., 2014 (USA)</td>
<td>Determine the feasibility and acceptability of a multimodal resilience training program</td>
<td>Randomised controlled trial, survey, CD-RISC-25</td>
<td>27 ICU nurses with low resilience (CD-RISC-25 scores ≤82), treatment group; 13, control group; 14</td>
<td>- Resilience program feasible and acceptable. - Significant improvements in resilience from pre- to post-intervention for both intervention and control groups.</td>
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<tr>
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<td>Turan, 2021 (Turkey)</td>
<td>Investigate the effects of an anger management psychoeducation program on resilience</td>
<td>Randomised controlled trial, survey, RSA</td>
<td>- 32 ICU nurses (treatment group; 16, control group; 16) - Single private hospital</td>
<td>- Significant increase in resilience (all subscales and total score) for intervention compared to control at 1-month post-intervention, sustained to 2-month follow-up.</td>
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<tr>
<td>Babanataj et al., 2019 (Iran)</td>
<td>Determine the effect of resilience training program on occupational stress and resilience</td>
<td>Quasi-experimental, single group pre-test &amp; post-test approach, survey, CD-RISC-25</td>
<td>- 30 ICU nurses (experimental group), no control group - Multi-ICUs and haemodialysis unit - Single university hospital</td>
<td>- Significant increase in resilience from pre-to post-intervention (large effect size).</td>
</tr>
<tr>
<td>Al Barmawi et al., 2019 (Jordan)</td>
<td>Explore the relationship between CS and coping strategies</td>
<td>Cross-sectional, survey, ProQoL 5</td>
<td>- 228 nurses - Multi-ICUs and emergency department - Four governmental teaching hospitals</td>
<td>- CS level moderate. - Sex, type of unit, level of coping strategies associated with CS. - Problem-solving predicted CS.</td>
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<tr>
<td>Al-Majid et al., 2018 (USA)</td>
<td>Assess the degree of CS among critical care, oncology, and charge nurses.</td>
<td>Cross-sectional, survey, ProQoL 5</td>
<td>- 48 nurses (30 critical care nurses, 18 oncology nurses) - Single community hospital</td>
<td>- No difference in CS between direct care nurses and charge nurses. - Nursing experience associated with CS.</td>
</tr>
<tr>
<td>Arrogante and Aparicio-Zaldivar, 2017 (Spain)</td>
<td>Analyse the mediational role of resilience in relationships between burnout and health status</td>
<td>Cross-sectional, survey, CD-RISC-10</td>
<td>- 52 critical care professionals (30 nurses, 14 nursing assistants, and 8 physicians)</td>
<td>- Mean score of resilience = 29.9±4.01. - Burnout and mental health status associated with resilience.</td>
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<tr>
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<td>Ata et al., 2020 (Turkey)</td>
<td>Determine the relationship between resilience and CS</td>
<td>Cross-sectional, face-to face interviewing, ProQoL 5 &amp; RSA</td>
<td>- 79 ICU nurses - Multi- ICUs - Single State Hospital.</td>
<td>- CS level moderate. - Resilience mean score = 128.67±14.84. - Resilience associated with CS but not STS.</td>
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<tr>
<td>Cho and Kang, 2017 (South Korea)</td>
<td>Explain the relationship among Type D personality, resilience, and PTSD symptoms</td>
<td>Cross-sectional, survey, CD-RISC-25</td>
<td>- 179 ICU nurses - Multi-ICUs - Seven hospitals</td>
<td>- Mean score of resilience = 59.56±12.32. - Type D personality and PTSD symptoms negatively correlated with resilience.</td>
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<tr>
<td>Elkonin and Van der Vyver, 2011 (South Africa)</td>
<td>Explore the relationship between CS and CF</td>
<td>Exploratory–descriptive, survey, ProQoL 5</td>
<td>- 30 ICU nurses - Three ICUs - Single private health care</td>
<td>- CS level moderate. - Silencing response and burnout negatively correlated with CS.</td>
</tr>
<tr>
<td>Fahey and Glasofer, 2016 (USA)</td>
<td>Assess CS and CF</td>
<td>Cross-sectional, survey, ProQoL 5</td>
<td>- 29 ICU nurses - Single community hospital</td>
<td>- CS level moderate. - Burnout negatively correlated with CS.</td>
</tr>
<tr>
<td>Highfield and Parry-Jones, 2020 (UK)</td>
<td>Examine CS levels</td>
<td>Cross-sectional, survey, ProQoL 5</td>
<td>- 799 ICU doctors - Multi-hospitals</td>
<td>- STS, age, gender, and size of unit not correlated with CS.</td>
</tr>
<tr>
<td>Jakimowicz et al., 2018 (Australia)</td>
<td>Examine factors predicting and contributing to CS</td>
<td>Cross-sectional, survey, ProQoL 5</td>
<td>- 98 ICU nurses - Two adult general ICUs - Multisite hospital, one tertiary referral hospital and one regional teaching hospital.</td>
<td>- CS level moderate. - CS negatively associated with STS and burnout. - Age not correlated with CS. - Years of practice, year of tenure, educational level and place of work correlated with CS.</td>
</tr>
<tr>
<td>Kawar et al., 2019 (USA)</td>
<td>Investigate the relationship between individual-level factors and CS</td>
<td>Cross-sectional, online survey, ProQoL 5</td>
<td>- 1174 nurses - Multi-departments - Multisite hospital, 14</td>
<td>- CS level moderate. - Primary practice area, work experience, employment and shift</td>
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<tr>
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<td>Kelly and Lefton, 2017 (USA)</td>
<td>Examine the effect of meaningful recognition and other predictors on CS</td>
<td>Cross-sectional, online survey, ProQoL 5</td>
<td>- 1136 ICU nurses - Multisite hospitals</td>
<td>CS level moderate. - Higher meaningful recognition predicted higher CS. - Gender, age, staying over shift, job enjoyment, job satisfaction predicted CS.</td>
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<tr>
<td>Kelly et al., 2021 (USA)</td>
<td>Identify the key elements of a healthy work environment associated with CS</td>
<td>Prospective cohort, , online survey, ProQoL 5</td>
<td>- 779 ICU nurses - 24 adult ICUs - 13 hospitals within 1 health system</td>
<td>CS level moderate. - Age, recognition with award nomination, and healthy work environment (meaningful recognition, effective decision-making) predicted CS. - Educational levels and turnover rate not associated with CS.</td>
</tr>
<tr>
<td>Kelly and Todd, 2017 (USA)</td>
<td>Examine the healthy work environment associated with CS</td>
<td>Cross-sectional, online survey, ProQoL 5</td>
<td>- 105 ICU nurses - Three ICUs - Single academic medical centre</td>
<td>CS level moderate. - Healthy work environment (skilled communication, true collaboration, meaningful recognition, and authentic leadership) positively correlated with CS. - Higher meaningful recognition, authentic leadership and lower burnout predicted CS.</td>
</tr>
<tr>
<td>Mason et al., 2014 (USA)</td>
<td>Examine the relationship between CS and work engagement</td>
<td>Cross-sectional, online survey, ProQoL 5</td>
<td>- 26 ICU nurses - Single academic medical centre</td>
<td>CS level moderate. - Overall work engagement and dedication positively correlated with CS.</td>
</tr>
<tr>
<td>Mealer et al., 2017 (USA)</td>
<td>Identify factors that affect resilience</td>
<td>Cross-sectional, online</td>
<td>- 744 ICU nurses</td>
<td>Postgraduate (masters) degree, older age, years in ICU, type</td>
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<tr>
<td>Mealer et al., 2012 (USA)</td>
<td>Determine the relationship between resilience and healthier psychological profiles</td>
<td>Cross-sectional, online survey, CD-RISC-25</td>
<td>Multisite hospitals across USA</td>
<td>Few participants scored highly on resilience. - Lower PTSD, anxiety, depression and burnout all associated with high resilience. - Age and work experience associated with resilience. - Educational levels, gender, exercise, marital status, and type of unit not associated with resilience.</td>
</tr>
<tr>
<td>Mohammadi et al., 2017 (Iran)</td>
<td>Examine the relationship between professional quality of life and caring ability</td>
<td>Cross-sectional, survey, ProQoL 5</td>
<td>Single university hospital</td>
<td>CS level moderate to high. - Caring ability (knowledge, patience) positively correlated with CS.</td>
</tr>
<tr>
<td>Monroe et al., 2020 (USA)</td>
<td>Assess the relationship between the healthy work environment and professional quality of life</td>
<td>Cross-sectional, online survey, ProQoL 5</td>
<td>Single university hospital</td>
<td>CS level moderate. - Healthy work environment (true collaboration, effective decision-making, authentic leadership) predicted CS.</td>
</tr>
<tr>
<td>Mooney et al., 2017 (USA)</td>
<td>Analyse professional quality of life in a combined population of ICU and oncology nurses.</td>
<td>Cross-sectional, online survey, ProQoL 5</td>
<td>Single community hospital</td>
<td>CS level in ICU nurses moderate. - Type of unit associated with CS levels.</td>
</tr>
<tr>
<td>Purvis et al., 2019 (USA)</td>
<td>Examine levels and contributing factors of resilience</td>
<td>Cross-sectional, online survey, CD-RISC-10</td>
<td>65 ICU healthcare staff (faculty, fellows, nurses, nurse practitioners, and other) - Single tertiary care centre</td>
<td>The median resilience score was 31, with range 28–36. - Older age associated with higher resilience. - Gender, role, race, faith orientation, and marital status not associated with resilience.</td>
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<tr>
<td>Rushton et al, 2015 (USA)</td>
<td>Explore factors involved in resilience</td>
<td>Cross-sectional, survey, CD-RISC-25</td>
<td>114 nurses from Multi-ICUs - Four hospitals in a health care system</td>
<td>- Mean score±SD for resilience = 73.9±11.2b.  - Resilience correlated with hope and personal meaning, negatively correlated with burnout and stress.  - Area of practice and years of nursing experience not associated with resilience.</td>
</tr>
<tr>
<td>Salimi et al., 2020 (Iran)</td>
<td>Investigate the relationship between CF and CS</td>
<td>Cross-sectional, survey, ProQoL 5</td>
<td>400 ICU nurses - Multi-ICUs - Eight educational hospitals</td>
<td>- CS level moderate.  - CS negatively correlated with STS.  - Older age and more years in nursing associated with CS.  - Gender, marriage, education, years in current workplace, type of unit and shift work not associated with CS.</td>
</tr>
<tr>
<td>Sawatzky et al., 2015 (Canada)</td>
<td>Explore the key predictors of nurse retention in ICU</td>
<td>Cross-sectional, online survey, ProQoL 5</td>
<td>188 ICU nurses - Multisite hospitals, 11 hospitals (tertiary and community hospitals)</td>
<td>- CS negatively associated with intention to leave critical care unit and leave nursing. Nursing competence, control/responsibility, and education level (diploma rather than degree) predicted CS.</td>
</tr>
<tr>
<td>Shen et al., 2015 (China)</td>
<td>Investigate the professional quality of life of Chinese nurses and possible risk factors</td>
<td>Cross-sectional, survey, ProQoL 5</td>
<td>752 nurses - Multi – department - Four first class general hospitals</td>
<td>- CS level among ICU nurses moderate.  - Type of unit and working position associated with CS.</td>
</tr>
<tr>
<td>Storm and Chen, 2021 (USA)</td>
<td>Investigate professional quality of life and personal characteristics associated with alarm fatigue</td>
<td>Cross-sectional, observation and survey, ProQoL 5</td>
<td>52 ICU nurses - Multi-ICUs - Three medical centres</td>
<td>- CS level among ICU nurses moderate.  - Alarm fatigue not associated with CS.</td>
</tr>
<tr>
<td>Todaro-Franceschi, 2013 (USA)</td>
<td>Identify relationships between ICU</td>
<td>Exploratory descriptive, online</td>
<td>473 ICU nurses</td>
<td>- Preparedness and ability to provide end-</td>
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<tr>
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<td>Wang et al., 2020 (China)</td>
<td>Explore the prevalence and factors associated with CS</td>
<td>Cross-sectional, survey, ProQoL 5</td>
<td>- 1044 nurses - Multi-department - Eleven tertiary hospitals</td>
<td>of-life care correlated with CS.  - STS and burnout negatively correlated with CS.  - CS level among ICU nurses moderate.  - CS weakly correlated with STS, negatively correlated with burnout.  - Age, gender (female), marital status (married), &gt;10 years nursing experience, senior work position and title, average ≤ 8 hours work/day, day shift, not smoking, sleep quality, exercise frequency, and job satisfaction associated with CS.  - Education level, type of unit, second-hand smoking, alcohol use, and amount of sleep not associated with CS.</td>
</tr>
<tr>
<td>Ying et al., 2020 (Malaysia)</td>
<td>Assess the association between perceived nursing practice environment, resilience, and intention to leave</td>
<td>Cross-sectional, survey, CD-RISC-25</td>
<td>- 229 ICU nurses - Four adult ICUs and Two NICUs of - Single public teaching hospital</td>
<td>Mean score of resilience 68.94±10.83 (range 43-96) = moderate level.  - Resilience associated with older age, but not gender, marital status, education, work unit, nursing experience, or length of time in unit  - Resilience predicted intention to leave but only after controlling for demographic variables and nursing practice environment.</td>
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<tr>
<td>Young et al., 2011 (USA)</td>
<td>Determine the prevalence of CS, burnout, and STS in nurses from ICU</td>
<td>Cross-sectional, survey, ProQoL 5</td>
<td>- 70 nurses (ICUs=45, intermediate care unit=25)</td>
<td>CS level moderate.  - CS higher for nurses from intermediate care unit (60% high, 40% average) compared to</td>
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<tr>
<td>Yu et al., 2020 (New Zealand)</td>
<td>Assess resilience levels and the associated personal and physical activity behavioural factors</td>
<td>Cross-sectional, online survey, CD-RISC-25</td>
<td>- 93 ICU nurses - Three tertiary teaching hospitals</td>
<td>- Mean resilience score 73.0±9.6 = low levels. - Resilience associated with gender (male), marital status (married), religious beliefs, non-European ethnicity, moderate physical activity, moderate-to-vigorous physical activity at work, and not sleeping during leisure time.</td>
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<td>Qualitative Studies (n=3)</td>
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<tr>
<td>Jackson et al., 2018 (Canada)</td>
<td>Explore the process of resilience for ICU nurses in the face of workplace adversity</td>
<td>Grounded theory, purposive and snowball sampling, face-to-face in-depth interviews</td>
<td>- 11 ICU nurses - A medical-surgical ICU - Single urban, teaching hospital</td>
<td>- Resilience reflected how nurses are able to address workplace adversity. - Techniques to manage exposure as a resilience process were protecting, processing, decontaminating, and distancing.</td>
</tr>
<tr>
<td>Jakimowicz et al., 2018 (Australia)</td>
<td>Explore patient-centred nursing, CS, and CF from ICU nurses’ perspectives.</td>
<td>Grounded theory, purposive sampling, in-depth interviews</td>
<td>- 21 ICU nurses - Two ICUs - Multisite hospital, one tertiary referral hospital and a regional teaching hospital</td>
<td>- Compassionate patient-centred nursing may enhance critical care nurses’ experience of CS.</td>
</tr>
<tr>
<td>Mealer et al., 2012 (USA)</td>
<td>Identify personal characteristics and behaviours of highly resilient ICU nurses</td>
<td>Ethnography, purposive sampling, semi-structured telephone interviews</td>
<td>- 27 ICU nurses - Multi-ICUs</td>
<td>- Characteristics of highly resilient nurses included optimism, finding a resilient role model, developing active coping skills, supportive social network, physical exercise, developing a</td>
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</table>
Quality assessment

The Mixed Methods Appraisal Tool was used for quality appraisal (Hong et al., 2018) (see Appendix 2). In 18/37 studies at least one methodological quality criterion was not met. Most quantitative descriptive studies (n = 12) had a risk of non-response bias as indicated by low response rates (Al-Majid et al., 2018; Elkonin and Van der Vyver, 2011; Fahey and Glasofer, 2016; Highfield and Parry-Jones, 2020; Jakimowicz et al., 2018; Kelly and Todd, 2017; Mealer et al., 2012; Monroe et al., 2020; Mooney, e al, 2017; Sawatzky et al., 2015; Storm and Chen, 2021; Young et al., 2011). One RCT did not describe intervention adherence (Kharatzadeh, et al., 2020). Neither quantitative non-randomized study reported whether their interventions were administered as intended (Babanataj et al., 2019; Kelly and Lefton, 2017), and one did not report whether confounders were accounted for in the design and analysis (Kelly and Lefton, 2017). In contrast, quality criteria were met in all qualitative studies.

According to the National Health and Medical Research Council evidence hierarchy (2009), the level of evidence overall was low to high-quality, levels II-IV. Most studies were low-quality evidence (level III-2-IV) due to designs that were cross-sectional or exploratory (n = 29), qualitative (n = 3), prospective cohort (n=1), or non-randomised experimental (n = 1). The three RCTs were assessed to have produced high quality evidence.
Primary Outcomes

Primary outcomes were compassion satisfaction, resilience, and passion for work. Reported prevalence, correlates, and intervention efficacy for each primary outcome is presented below and summarised in Table 2.

Compassion satisfaction

Included studies all used the Professional Quality of Life Scale (ProQoL) version 5 to assess compassion satisfaction. A reliable and validated self-reported questionnaire (Kawar et al., 2019; Kelly and Todd, 2017), this 30-item instrument comprises three subscales: compassion satisfaction, burnout, and secondary traumatic stress. The 10-item compassion satisfaction subscale scores range from 10–50 (<23 = low compassion satisfaction, 23-41 = moderate compassion satisfaction, >41 = high compassion satisfaction) (Stamm, 2010). The average (mean) level of compassion satisfaction for the 17 studies of ICU nurses was “moderate”, with mean scores between 24.64–38; however, one study with nurses from Iran (Mohammadi et al., 2017) reported the greatest percentage of critical care nurses experiencing high levels of compassion satisfaction (55%). compassion satisfaction scores for ICU physicians in the UK were reported as moderate to high, with 76% scoring in the moderate range and 22% scoring in the high range (Highfield and Parry-Jones, 2020).

For demographic and personal factors, higher compassion satisfaction was correlated with more years of nursing experience (Al-Majid, 2018; Jakimowicz et al., 2018; Kawar et al., 2019; Shen et al., 2015); working night (rather than day) shift and casual (rather than full- or part-time) work (Kawar et al., 2019); seniority, with charge nurses having higher compassion satisfaction than general nurses (Shen et al., 2015), and female gender (Al Barmawi et al., 2019). Higher compassion satisfaction was also associated with older
age (Kelly et al., 2021) and post-graduate qualifications (Jakimowicz et al., 2018), although Sawatzky et al. (2015) found nurses with higher degrees had lower compassion satisfaction. Conversely, some studies reported no association between compassion satisfaction and age, gender, education level, and type or size of unit (Highfield and Parry-Jones, 2020; Jakimowicz et al., 2018; Kelly et al., 2021; Wang et al., 2020; Young et al., 2011).

Compassion satisfaction was associated with other psychological constructs such as resilience. Higher compassion satisfaction was associated with higher resilience (Ata et al., 2020) and use of coping strategies (Al Barmawi et al., 2019), as well as lower levels of burnout (Ata et al., 2020; Elkonin and Van der Vyver, 2011; Fahey and Glasofer, 2016; Kelly and Todd, 2017; Todaro-Franceschi, 2013) and secondary traumatic syndrome (Elkonin and Van der Vyver, 2011; Salimi et al., 2020; Todaro-Franceschi, 2013). In contrast, one study reported no association between compassion satisfaction and secondary traumatic stress (Fahey and Glasofer, 2016).

Higher compassion satisfaction was associated with work related factors including more effective decision-making, meaningful recognition, skilled communication, true collaboration, and authentic leadership (Kelly et al., 2021; Kelly and Todd, 2017; Monroe et al., 2020; Sawatzky et al., 2015). It was also associated with higher caring ability and nursing competence (Mohammadi et al., 2017; Sawatzky et al., 2015; Todaro-Franceschi, 2013), job enjoyment (Kelly and Todd, 2017), job satisfaction (Kelly and Todd, 2017; Sawatzky et al., 2015), and work engagement (Mason et al., 2014). Relationships between compassion satisfaction and staff turnover were mixed (Kelly et al., 2021; Kawar et al., 2019).
To sum up, most included studies generally reported moderate level of compassion satisfaction among ICU HCPs. All studies utilised the ProQoL version 5 to measure compassion satisfaction. Personal characteristics, work-related factors and some psychological constructs were associated with compassion satisfaction in spite of inconsistencies across studies.

**Resilience**

Resilience was assessed using the Connor-Davidson Resilience Scale (CD-RISC-10 in two studies, or CD-RISC-25 in eight studies) and/or the Resilience Scale for Adults (RSA in two studies), with higher total scores indicating greater resilience, although two studies used a cut-off score >91 to indicate “high” resilience (Mealer et al., 2012; Yu et al., 2020). Davidson (2020) recommended scoring based on the total score of all items with higher scores reflecting higher resilience. Variation regarding the ways included studies interpreted their CD-RISC results may be a limitation. Mean CD-RISC-25 scores (total possible score range 0-100) ranged from 59 – 73 (Cho and Kang, 2017; Rushton et al., 2015; Ying et al., 2020; Yu et al., 2020). Mealer and colleagues (2012) found that most participants (78%) did not score in the high range with an average score of less than 91. Two studies using the CD-RISC-10 (total possible score range 0-40) reported average scores of 29.9 (Arrogante and Aparicio-Zaldivar 2017) and 31 (range 28–36) (Purvis et al., 2019). Using the RSA scale (total possible score range 33 - 165), Ata et al. (2020) reported a mean resilience score of 128.67.

Demographic factors associated with resilience varied across studies. Higher resilience was associated with older age (Purvis et al., 2019) and male gender, being married, non-religiousness, and European ethnicity (Yu et al., 2020). In contrast, other studies reported no association with gender (Mealer et al., 2012; Purvis et al., 2019; Yu
et al., 2020), race (Purvis et al., 2019), or marital status (Purvis et al., 2019). There was no relationship between resilience and educational levels or engaging in regular exercise (Mealer et al., 2012), or work position (Purvis et al., 2019).

Resilience was also associated with psychological factors including personality type and selected psychological syndromes and disorders. Higher resilience was associated with lower prevalence of burnout syndrome (Arrogante and Aparicio-Zaldivar, 2017; Ata et al., 2020; Mealer et al., 2012) and post-traumatic stress disorder (Cho and Kang, 2017), and lower prevalence of secondary traumatic syndrome, anxiety, and depression (Mealer et al., 2012). Only one study (Ata et al., 2020) found no relationship between resilience and secondary traumatic stress. One study found depressive or anxious personality characteristics were associated with lower resilience (Cho and Kang, 2017).

Lastly, this review has identified inconsistencies of the level of resilience across included studies and resilience was measured using various instruments. Personal and psychological factors were linked to resilience despite variation across the studies.

**Passion for work**

Although previous research has demonstrated benefits of passion for work with job satisfaction and job engagement (Špehar et al., 2016), this review found no empirical research investigating this concept with healthcare professionals working in ICU.

**Intervention studies**

Four studies evaluated interventions in relation to one or more of the primary outcomes. One study aimed to enhance compassion satisfaction and three to improve resilience among nurses working in the ICU. Kharatzadeh, et al. (2020) aimed to enhance emotional regulation skills and compassion satisfaction using a RCT design. The psychologist-delivered group-based program integrated elements of cognitive
behavioural therapy (CBT), mindfulness-based interventions, dialectical behaviour therapy, problem-solving therapies, and emotion-focused therapy in six, two-hourly sessions. The emotional regulation training group reported a significant increase in compassion satisfaction (ProQoL 5) scores post-intervention compared to the wait-list control group with a medium effect size (Kharatzadeh, et al., 2020). Another RCT tested a group-based anger management psychoeducation program designed to enhance nurses’ positive affect and resilience (Turan, 2021). The eight weekly sessions (60–90 minutes each) included psychoeducation on anger and a range of exercises and strategies drawn from CBT. Compared to controls, the intervention group reported significant intervention effects for all resilience (RSA) subscales and the total score at 1-month post-intervention, with effects being sustained to 2-months post-intervention.

One quasi-experimental trial (Babanataj et al., 2019) offered five psychoeducation sessions (90 - 120 minutes each) about resilience, characteristics of resilient individuals, the importance of internal (e.g., optimism) and external (e.g., social support) supportive factors, and strategies to develop resilience (e.g., communication with others, self-awareness, self-care). This study showed a significant improvement in nurses’ resilience (CD-RISC scores) at post-intervention, with a large effect size (Babanataj et al., 2019).

A pilot RCT tested the acceptability, feasibility, and efficacy of a complex multimodal resilience training program for nurses with low resilience (CD-RISC-25 scores ≤82) (Mealer et al., 2014). The 2-day educational workshop was supplemented by 12 weeks of self-directed exercises. Content included cognitive behavioural therapy and self-care techniques, training on coping mechanisms and stress-reduction techniques (mindfulness-based stress reduction, aerobic exercise) as well as written exposure therapy and individualised counselling (event-triggered CBT) sessions. The authors reported
significant within-group pre- to post-intervention improvements in resilience (CD-RISC-25 scores) for both intervention and control groups (Mealer et al., 2014).

Discussion

Research on the psychological well-being of ICU staff is a relatively new and emerging area of research. Of the thirty-seven included studies, all assessed clinicians’ compassion satisfaction and/or resilience, but no studies examined passion for work. Moreover, most studies used descriptive or cross-sectional designs, and there was a paucity of studies testing interventions to improve outcomes for healthcare professionals. However, there may be bias due to selection of only peer-reviewed studies published in English, which may have excluded some relevant studies from the review and assessing the risk of publication bias was not performed.

Included studies generally reported moderate levels of compassion satisfaction amongst nurses and physicians working in ICU. Results are comparable to those of a recent a systematic review and meta-analysis by Xie et al. (2021) which also reported an overall moderate level of compassion satisfaction among nurses across 11 countries worldwide, although they did report differences across continents, with nurses in Asian countries reporting the lowest levels and nurses in the United States and Europe reporting the highest levels of compassion satisfaction.

Levels of resilience varied considerably across included studies. Although the use of different instruments to measure resilience made comparison between studies difficult, greater variability in resilience scores may be due to the nature of resilience. Resilience can be influenced by both personal as well as contextual factors (Lock et al. 2020), contributing to variability across studies. This notion is supported by an integrative review by Hart et al. (2014) who drew similar conclusions about nurses’ resilience.
There were also inconsistent associations amongst personal and professional variables and compassion satisfaction and resilience among HCPs working in ICU. For example, Kelly and Lefton (2017) reported that age, gender, and shift work were associated with compassion satisfaction whereas the study by Highfield and Parry-Jones (2020) found that age, gender, and the size of the work unit were not associated with compassion satisfaction. Similarly, a study by Yu et al. (2020) found that resilience was significantly associated with gender whereas Mealer and colleagues (2012) found no such relationship. Previous reviews by Yu et al. (2019) and Hart et al. (2014) also reported some inconsistencies in the data on relationships between personal factors and nurses’ resilience, possibly due to variability in the measurement of resilience.

Only one study examined the association between resilience and compassion satisfaction among ICU nurses (Ata et al., 2020). Further research is necessary to clarify the relationship between these two concepts and the influence of personal and professional factors. Future research should also focus on understanding the relationship of these concepts to passion for work which has not yet been examined in the ICU context. The quality and use (e.g., consistency in choice of cut-off scores) of instruments for measuring resilience should also be evaluated. Interestingly, no characteristics of patients receiving care from the ICU nurses and physicians were examined in the included studies. It could be that interactions with patients’ family members may contribute to satisfaction and coping. Patient and family characteristics such as satisfaction with care, family engagement in care and patient-centred nursing care could be potentially important to explaining variations in compassion satisfaction, resilience, and passion for work and should be included in future research (Hetland et al., 2017; Jakimowicz et al., 2018).
Four studies evaluated outcomes of interventions designed to improve clinicians’ compassion satisfaction or resilience. The interventions were diverse in terms of therapeutic approach, mode of delivery, duration, and incorporating a wide range of strategies. Established psychotherapeutic approaches included cognitive behavioural therapy, mindfulness-based stress reduction, and a variety of coping and self-care strategies. Three out of four studies reported significant intervention effects on compassion satisfaction or resilience with moderate to large effect sizes, but none addressed workplace factors. The only study which failed to demonstrate a significant intervention effect was the pilot RCT by Mealer et al (2014) which found significant improvements in resilience for the intervention and control groups. However, all participants worked in the same ICU, increasing the risk of contamination of the control group. Results of our review therefore align with those of a systematic review and meta-analysis by Joyce and colleagues (2018) which found that interventions based on a combination of cognitive behavioural therapy and mindfulness techniques demonstrate positive impacts on individuals’ resilience. Although our review suggests that interventions designed to improve compassion satisfaction and resilience may improve outcomes for ICU nurses there were no studies testing interventions with ICU physicians or other health care professional groups. Hence, there is a need for additional evidence regarding the efficacy of interventions targeting compassion satisfaction and resilience in the ICU context.

Limitations

To reduce risk of bias, two reviewers independently screened and determined the studies to be included; and an expert health librarian was consulted to refine the search strategy. Despite this, limitations are acknowledged. A narrative review was presented
as the heterogeneity of interventions and measures meant that a meta-analysis was not possible. Risk of non-response bias was evident in some of the included studies. Participants who did not respond may differ from those who did participate, and this may be a limitation. Publication bias may be a limitation as the review was limited to peer-reviewed studies published in English and this may have excluded some relevant studies from the search process. The initial search included trial registers (Cochrane and JBI), however no published results were available for relevant protocols. In addition, the risk of publication bias of included studies was not assessed.

**Conclusion and implications for future research**

This mixed methods review identified moderate levels of compassion satisfaction among ICU nurses and physicians, but findings regarding resilience remain unclear. We found no empirical research examining prevalence of passion for work among ICU staff. Personal characteristics and job-related factors were identified as important correlates of compassion satisfaction and resilience but there were some inconsistencies across studies. Although only four studies used experimental designs to test the effects of interventions, results suggest that multi-component interventions incorporating cognitive behavioural therapy and mindfulness-based approaches may be effective.

Most published research in this area has been conducted in the United States. Additional research is needed, especially on other continents that may have different staff characteristics and diverse cultural and social contexts. There is limited research that describes the relationship between resilience, passion for work, and compassion satisfaction, and a dearth of studies examining relationships between characteristics of patients and their families and staff wellbeing, or how staff perceive passion for work in ICU. Further research is needed to facilitate an understanding of how to enhance staff
wellbeing and their ability to cope with workplace challenges, enhance their clinical performance, and increase the quality of care for patients.

**Declaration of Competing Interest**

The authors declare that they have no known competing commercial interests or personal relationships that could have appeared to influence the work reported in this study.

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**Conflict of interest**

No conflict of interest has been declared by the authors.

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