**Supplementary:**

**Table S1**: **CASP qualitative checklist**

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**Paper for appraisal and reference:**

| Section A: Are the results valid? | | |
|---|---|---|
| 1. Was there a clear statement of the aims of the research? | Yes ☐<br>Can't Tell ☐<br>No ☐ | HINT: Consider<br>• what was the goal of the research<br>• why it was thought important<br>• its relevance |
| Comments: | | |
| 2. Is a qualitative methodology appropriate? | Yes ☐<br>Can't Tell ☐<br>No ☐ | HINT: Consider<br>• If the research seeks to interpret or illuminate the actions and/or subjective experiences of research participants<br>• Is qualitative research the right methodology for addressing the research goal |
| Comments: | | |
| Is it worth continuing? | | |
| 3. Was the research design appropriate to address the aims of the research? | Yes ☐<br>Can't Tell ☐<br>No ☐ | HINT: Consider<br>• if the researcher has justified the research design (e.g. have they discussed how they decided which method to use) |
| Comments: | | |

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4. Was the recruitment strategy appropriate to the aims of the research?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider
- If the researcher has explained how the participants were selected
- If they explained why the participants they selected were the most appropriate to provide access to the type of knowledge sought by the study
- If there are any discussions around recruitment (e.g. why some people chose not to take part)

Comments:

5. Was the data collected in a way that addressed the research issue?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider
- If the setting for the data collection was justified
- If it is clear how data were collected (e.g. focus group, semi-structured interview etc.)
- If the researcher has justified the methods chosen
- If the researcher has made the methods explicit (e.g. for interview method, is there an indication of how interviews are conducted, or did they use a topic guide)
- If methods were modified during the study. If so, has the researcher explained how and why
- If the form of data is clear (e.g. tape recordings, video material, notes etc.)
- If the researcher has discussed saturation of data

Comments:

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6. Has the relationship between researcher and participants been adequately considered?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider

- If the researcher critically examined their own role, potential bias and influence during (a) formulation of the research questions (b) data collection, including sample recruitment and choice of location
- How the researcher responded to events during the study and whether they considered the implications of any changes in the research design

Comments:

## Section B: What are the results?

7. Have ethical issues been taken into consideration?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider

- If there are sufficient details of how the research was explained to participants for the reader to assess whether ethical standards were maintained
- If the researcher has discussed issues raised by the study (e.g. issues around informed consent or confidentiality or how they have handled the effects of the study on the participants during and after the study)
- If approval has been sought from the ethics committee

Comments:

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8. Was the data analysis sufficiently rigorous?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider
- If there is an in-depth description of the analysis process
- If thematic analysis is used. If so, is it clear how the categories/themes were derived from the data
- Whether the researcher explains how the data presented were selected from the original sample to demonstrate the analysis process
- If sufficient data are presented to support the findings
- To what extent contradictory data are taken into account
- Whether the researcher critically examined their own role, potential bias and influence during analysis and selection of data for presentation

Comments:

9. Is there a clear statement of findings?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider whether
- If the findings are explicit
- If there is adequate discussion of the evidence both for and against the researcher's arguments
- If the researcher has discussed the credibility of their findings (e.g. triangulation, respondent validation, more than one analyst)
- If the findings are discussed in relation to the original research question

Comments:

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| Section C: Will the results help locally? |
|---|

10. How valuable is the research?

HINT: Consider

- If the researcher discusses the contribution the study makes to existing knowledge or understanding (e.g. do they consider the findings in relation to current practice or policy, or relevant research-based literature
- If they identify new areas where research is necessary
- If the researchers have discussed whether or how the findings can be transferred to other populations or considered other ways the research may be used

| Comments: |
|---|
| |

**Table S2: CASP Randomized controlled trial checklist**

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**Study and citation:** .....

| Section A: Is the basic study design valid for a randomised controlled trial? | | | |
|---|---|---|---|
| **1.** **Did the study address a clearly focused research question?**<br>*CONSIDER:*<br>*Was the study designed to assess the outcomes of an intervention?*<br>*Is the research question 'focused' in terms of:*<br>• *Population studied*<br>• *Intervention given*<br>• *Comparator chosen*<br>• *Outcomes measured?* | Yes ☐ | No ☐ | Can't tell ☐ |
| **2.** **Was the assignment of participants to interventions randomised?**<br>*CONSIDER:*<br>• *How was randomisation carried out? Was the method appropriate?*<br>• *Was randomisation sufficient to eliminate systematic bias?*<br>• *Was the allocation sequence concealed from investigators and participants?* | Yes ☐ | No ☐ | Can't tell ☐ |
| **3.** **Were all participants who entered the study accounted for at its conclusion?**<br>*CONSIDER:*<br>• *Were losses to follow-up and exclusions after randomisation accounted for?*<br>• *Were participants analysed in the study groups to which they were randomised (intention-to-treat analysis)?*<br>• *Was the study stopped early? If so, what was the reason?* | Yes ☐ | No ☐ | Can't tell ☐ |

| Section B: Was the study methodologically sound? | | | |
|---|---|---|---|
| **4.**<br>• Were the participants 'blind' to intervention they were given?<br>• Were the investigators 'blind' to the intervention they were giving to participants?<br>• Were the people assessing/analysing outcome/s 'blinded'? | Yes<br>☐<br>☐<br>☐ | No<br>☐<br>☐<br>☐ | Can't tell<br>☐<br>☐<br>☐ |
| **5.** **Were the study groups similar at the start of the randomised controlled trial?**<br>*CONSIDER:*<br>• *Were the baseline characteristics of each study group (e.g. age, sex, socio-economic group) clearly set out?*<br>• *Were there any differences between the study groups that could affect the outcome/s?* | Yes ☐ | No ☐ | Can't tell ☐ |

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| | | | |
|---|---|---|---|
| 6. Apart from the experimental intervention, did each study group receive the same level of care (that is, were they treated equally)?<br><br>*CONSIDER:*<br>• *Was there a clearly defined study protocol?*<br>• *If any additional interventions were given (e.g. tests or treatments), were they similar between the study groups?*<br>• *Were the follow-up intervals the same for each study group?* | Yes ☐ | No ☐ | Can't tell ☐ |

## Section C: What are the results?

| | | | |
|---|---|---|---|
| **7.** Were the effects of intervention reported comprehensively?<br>*CONSIDER:*<br>• *Was a power calculation undertaken?*<br>• *What outcomes were measured, and were they clearly specified?*<br>• *How were the results expressed? For binary outcomes, were relative and absolute effects reported?*<br>• *Were the results reported for each outcome in each study group at each follow-up interval?*<br>• *Was there any missing or incomplete data?*<br>• *Was there differential drop-out between the study groups that could affect the results?*<br>• *Were potential sources of bias identified?*<br>• *Which statistical tests were used?*<br>• *Were p values reported?* | Yes ☐ | No ☐ | Can't tell ☐ |
| 8. Was the precision of the estimate of the intervention or treatment effect reported?<br><br>*CONSIDER:*<br>• *Were confidence intervals (CIs) reported?* | Yes ☐ | No ☐ | Can't tell ☐ |
| 9. Do the benefits of the experimental intervention outweigh the harms and costs?<br><br>*CONSIDER:*<br>• *What was the size of the intervention or treatment effect?*<br>• *Were harms or unintended effects reported for each study group?*<br>• *Was a cost-effectiveness analysis undertaken? (Cost-effectiveness analysis allows a comparison to be made between different interventions used in the care of the same condition or problem.)* | Yes ☐ | No ☐ | Can't tell ☐ |

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| Section D: Will the results help locally? | | | |
|---|---|---|---|
| 10. | **Can the results be applied to your local population/in your context?**<br><br>*CONSIDER:*<br>• *Are the study participants similar to the people in your care?*<br>• *Would any differences between your population and the study participants alter the outcomes reported in the study?*<br>• *Are the outcomes important to your population?*<br>• *Are there any outcomes you would have wanted information on that have not been studied or reported?*<br>• *Are there any limitations of the study that would affect your decision?* | Yes ☐ | No ☐ Can't tell ☐ |
| 11. | **Would the experimental intervention provide greater value to the people in your care than any of the existing interventions?**<br><br>*CONSIDER:*<br>• *What resources are needed to introduce this intervention taking into account time, finances, and skills development or training needs?*<br>• *Are you able to disinvest resources in one or more existing interventions in order to be able to re-invest in the new intervention?* | Yes ☐ | No ☐ Can't tell ☐ |

**APPRAISAL SUMMARY:** *Record key points from your critical appraisal in this box. What is your conclusion about the paper? Would you use it to change your practice or to recommend changes to care/interventions used by your organisation? Could you judiciously implement this intervention without delay?*

**Table S3: AXIS checklist**

| | Question | Yes | No | Don't know/ Comment |
|---|---|---|---|---|
| ***Introduction*** | | | | |
| 1 | Were the aims/objectives of the study clear? | | | |
| ***Methods*** | | | | |
| 2 | Was the study design appropriate for the stated aim(s)? | | | |
| 3 | Was the sample size justified? | | | |
| 4 | Was the target/reference population clearly defined? (Is it clear who the research was about?) | | | |
| 5 | Was the sample frame taken from an appropriate population base so that it closely represented the target/reference population under investigation? | | | |
| 6 | Was the selection process likely to select subjects/participants that were representative of the target/reference population under investigation? | | | |
| 7 | Were measures undertaken to address and categorise non-responders? | | | |
| 8 | Were the risk factor and outcome variables measured appropriate to the aims of the study? | | | |
| 9 | Were the risk factor and outcome variables measured correctly using instruments/measurements that had been trialled, piloted or published previously? | | | |
| 10 | Is it clear what was used to determined statistical significance and/or precision estimates? (e.g. p-values, confidence intervals) | | | |
| 11 | Were the methods (including statistical methods) sufficiently described to enable them to be repeated? | | | |
| ***Results*** | | | | |
| 12 | Were the basic data adequately described? | | | |
| 13 | Does the response rate raise concerns about non-response bias? | | | |
| 14 | If appropriate, was information about non-responders described? | | | |
| 15 | Were the results internally consistent? | | | |
| 16 | Were the results presented for all the analyses described in the methods? | | | |
| ***Discussion*** | | | | |
| 17 | Were the authors' discussions and conclusions justified by the results? | | | |
| 18 | Were the limitations of the study discussed? | | | |
| ***Other*** | | | | |
| 19 | Were there any funding sources or conflicts of interest that may affect the authors' interpretation of the results? | | | |
| 20 | Was ethical approval or consent of participants attained? | | | |

**Table S4: MMAT checklist**

| Category of study designs | Methodological quality criteria | Responses | | | |
|---|---|---|---|---|---|
| | | Yes | No | Can't tell | Comments |
| Screening questions (for all types) | S1. Are there clear research questions? | | | | |
| | S2. Do the collected data allow to address the research questions? | | | | |
| | *Further appraisal may not be feasible or appropriate when the answer is 'No' or 'Can't tell' to one or both screening questions.* | | | | |
| 1. Qualitative | 1.1. Is the qualitative approach appropriate to answer the research question? | | | | |
| | 1.2. Are the qualitative data collection methods adequate to address the research question? | | | | |
| | 1.3. Are the findings adequately derived from the data? | | | | |
| | 1.4. Is the interpretation of results sufficiently substantiated by data? | | | | |
| | 1.5. Is there coherence between qualitative data sources, collection, analysis and interpretation? | | | | |
| 2. Quantitative randomized controlled trials | 2.1. Is randomization appropriately performed? | | | | |
| | 2.2. Are the groups comparable at baseline? | | | | |
| | 2.3. Are there complete outcome data? | | | | |
| | 2.4. Are outcome assessors blinded to the intervention provided? | | | | |
| | 2.5 Did the participants adhere to the assigned intervention? | | | | |
| 3. Quantitative non-randomized | 3.1. Are the participants representative of the target population? | | | | |
| | 3.2. Are measurements appropriate regarding both the outcome and intervention (or exposure)? | | | | |
| | 3.3. Are there complete outcome data? | | | | |
| | 3.4. Are the confounders accounted for in the design and analysis? | | | | |
| | 3.5. During the study period, is the intervention administered (or exposure occurred) as intended? | | | | |
| 4. Quantitative descriptive | 4.1. Is the sampling strategy relevant to address the research question? | | | | |
| | 4.2. Is the sample representative of the target population? | | | | |
| | 4.3. Are the measurements appropriate? | | | | |
| | 4.4. Is the risk of nonresponse bias low? | | | | |
| | 4.5. Is the statistical analysis appropriate to answer the research question? | | | | |
| 5. Mixed methods | 5.1. Is there an adequate rationale for using a mixed methods design to address the research question? | | | | |
| | 5.2. Are the different components of the study effectively integrated to answer the research question? | | | | |
| | 5.3. Are the outputs of the integration of qualitative and quantitative components adequately interpreted? | | | | |
| | 5.4. Are divergences and inconsistencies between quantitative and qualitative results adequately addressed? | | | | |
| | 5.5. Do the different components of the study adhere to the quality criteria of each tradition of the methods involved? | | | | |

**Table S5:** Evidence table

| Citation | Purpose, aims or research questions | Methodology: Site, design, data collection, sample | Findings | Strengths | Weaknesses |
|---|---|---|---|---|---|
| Fiske (2018) | To examine current nurse stressors, satisfiers, and coping processes in the NICU. | Site: Neonatal ICU (NICU) in 3 Magnet Facilities in North Carolina.<br>Study design: Mixed methods, an online survey.<br>Sample: 72 NICU nurses<br>Data collection: Survey data using the ICU Stressors Survey and the Ways of Coping Scale; and responding to free-text questions in Qualtrics. | Most nurses acknowledged that their work was stressful but they recognized the value of coping strategies to manage the stress. Team building and collegiality emerged as significant coping strategies. | Collecting both quantitative and qualitative data increased the comprehensiveness of the study.<br>Multi-site study. | Self-reporting.<br>Low response rate (30% of 243 nurses). |
| Al Barmawi et al. (2019) | To measure levels of compassion fatigue, burnout and satisfaction among critical care and emergency nurses, and investigate coping strategies as moderating factors and as predictors of levels of compassion fatigue | Site: Various ICUs and emergency department (ED) in Four Jordanian hospitals.<br>Study design: cross-sectional<br>Sample: 228 out of 270 ICU and ED nurses.<br>Data collection: Questionnaires: The Professional Quality of Life and the Coping Strategies Indicator scales. | Nurses with better coping strategies had lower levels of secondary stress syndrome and high compassion satisfaction. | Multiple-site study.<br>High response rate (84.4%). | Self-reported surveys reduce credibility.<br>Only examined a limited number of coping strategies. |
| Alharbi and Alshehry (2019) | To examine perceived stress and coping behaviors among nurses in intensive care units in Saudi Arabia, and the influence of coping mechanisms on stress. | Site: Surgery, cardiac, and paediatric ICUs in two tertiary training hospitals in Riyadh, Saudi Arabia<br>Study design: Descriptive cross-sectional, an online survey<br>Sample: 154 ICU nurses<br>Data collection: Brief COPE inventory to collect coping strategies data and Perceived Stress Scale-10 to collect data on perceived stress. | The commonest coping strategy was a belief in religion. Some coping strategies like acceptance reduced perceived stress while others such as behavioural disengagement and self-blame increased perceived stress. | Multi-site study.<br>Specific to ICU nurses.<br>Directly addressed coping strategies in reducing perceived stress. | Data was collected using rating scales; thus, it is not detailed.<br>Convenience sampling and self-reporting reduced the credibility of the findings. |
| Hancock et al. (2020) | To explore personal and organizational factors that contribute to burnout and moral distress in a Canadian academic intensive care unit (ICU) healthcare team | Site: Canadian academic ICU<br>Study design: qualitative<br>Sample: 35 members of ICU healthcare team including registered nurses, physicians, and respiratory therapists.<br>Data collection: Focus group discussions, each focus group comprised 4-8 professionals. | Participants described both self-destructive (like alcohol consumption) and self-constructive (like exercise) approaches that they use to cope with stress at the workplace. | The qualitative design facilitated in-depth discussion of the perceived stress and coping strategies.<br>Focus groups had only 4-8 participants, hence discussions were comprehensive. | Single-site study.<br>Self-selection for enrolment into focus groups implies the shared opinions may not be representative. |

| | | | | | |
|---|---|---|---|---|---|
| Kwiatosz-Muc et al. (2019) | To define the coping styles of anesthesiology and intensive care unit personnel and to evaluate the connections between the work environment as well as personal characteristics and the dominant coping styles | Site: 15 Polish hospitals<br>Study design: cross-sectional survey<br>Sample: 425; 311 nurses, 114 physicians.<br>Data collection: Surveying ICU and anaesthesiology personnel to collect coping data using the Coping Inventory for Stressful Situations and to collect perceived stress data using The Perceived Stress Scale. | Task-oriented coping style was the most dominant. Coping styles varied with differences in demographic characteristics. There was a positive correlation between emotion-oriented coping and affect-oriented coping with perceived stress, while task-oriented coping was negatively correlated with perceived stress. | Multi-site study. Investigated multiple copying strategies and classified them accordingly. | The surveyed nurses were mainly women, hence the patterns observed are for female nurses.<br>Self-reported. |
| Ozgundondu et al. (2019) | To examine the effects of progressive muscle relaxation combined with music on stress, fatigue and coping styles amongst intensive care unit (ICU) nurses. | Site: ICUs (coronary, internal medicine, anaesthesia) of a training and research hospital.<br>Study design: randomized controlled trial.<br>Sample: 56 nurses<br>Data collection: at baseline, at week four, eight, and 12 after intervention (progressive muscle relaxation) and control (attention-matched education). Data on stress levels, fatigue severity, and coping styles. | Coping strategies in the acceptance subdivision (instrumental support, venting, and emotional support) were significantly more common in the progressive muscle relaxation group than the control group. | RCTs provide level II evidence, which is high level evidence.<br>The setting included 3 types of ICUs, thus increasing generalizability of results. | Blinding was not applied either at the administration of the intervention or measurement of outcomes, hence a risk for selection and measurement bias.<br>The study was done only in one hospital; thus, the results can only be generalized in the hospital. |