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Effects of interventions aimed at improving nurses' work engagement in the workplace: a systematic review and meta-analysis protocol

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ABSTRACT

Introduction Work engagement enhances nurses' physical and mental health, well-being, job performance and satisfaction. This reduces turnover rates and improves patient care quality, making work engagement a crucial factor in the nursing workplace. However, no systematic review or meta-analysis has explored the effects of randomised controlled trial (RCT) interventions aimed at improving nurses' work engagement. This study aimed to evaluate the effectiveness of these interventions, providing healthcare organisations with evidence-based recommendations for enhancing work engagement among nurses.

Methods and analysis This systematic review and meta-analysis will use the PICO criteria: (P) nurses, (I) psychosocial interventions, (C) no intervention or non-work engagement interventions and (O) work engagement as a primary outcome. Published studies will be searched by September 2025 using databases such as the Cochrane Central Register of Controlled Trials, PubMed (MEDLINE), Embase, CINAHL, PsycINFO, PsycARTICLES and the Japan Medical Abstracts Society. Eligible studies must use RCT designs, assess the impact of interventions on nurses' work engagement and provide adequate data (sample sizes, means and SDs) to calculate effect sizes with 95% CIs. Publications must be written in English or Japanese as original articles. Two reviewers will independently select studies and assess the risk of bias. The methodological quality of the included studies will be evaluated using the Grading of Recommendation Assessment, Development and Evaluation approach. A meta-analysis will be conducted for statistical synthesis and publication bias will be assessed using Egger's test and a visual funnel plot. Heterogeneity will be evaluated using Q statistics.

Ethics and dissemination This systematic review and meta-analysis are based on existing studies and do not require ethical approval. The findings will be shared through publications in peer-reviewed international journals and presentations at relevant conferences, symposia and seminars.

PROSPERO registration number CRD42024510479.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ The primary strength of this study is its exclusive inclusion of articles using a randomised controlled trial design and systematic literature review with a comprehensive database search.
⇒ The limitation of this study is that the findings may not be generalised to the demographic characteristics of participants not included in the selected studies.
⇒ The search strategy is restricted to publications in only two languages, which may result in the exclusion of relevant data published in other languages.

INTRODUCTION

Work engagement is predicated on a positive psychological perspective on occupational mental health.[1 2] It is defined as a positive and fulfilling mental state toward work.[3 4] Work engagement encompasses three factors: 'feeling proud of and fulfilled by work' (dedication), 'being enthusiastic about work' (absorption) and 'feeling energised and energetic from work' (vigour); furthermore, it is positioned as the opposite of burnout.[3] Employees with high work engagement possess sufficient energy to meet job requirements.[5] Work engagement among nurses positively correlates with nurses' physical and mental health,[6 7] improved well-being and job performance,[8] increased job satisfaction,[9] decreased turnover intentions[10–12] and improved quality of care provided to patients.[13–15] Consequently, work engagement is associated with numerous positive outcomes in the nursing workplace. However, nurses frequently experience high levels of occupational stress,[16] which can cause burnout.[17] Research indicates that work engagement can effectively attenuate nurses' occupational stress.[14 18] Therefore, improving nurses' work engagement is important to ensure their mental and physical health, organisational health in the nursing workplace and quality of care.

Regarding intervention programmes to improve work engagement, systematic reviews of findings in the general workforce

have indicated that several psychosocial intervention programmes have been developed and can be effective, including building work resources (eg, support from supervisors and coworkers, increased job discretion and increased feedback from supervisors), building personal resources (eg, resiliency training), leadership training (eg, improvement of management skills for managers) and health promotion (eg, stress management skills such as cognitive behavioural therapy).[19 20] A meta-analysis based on 14 controlled studies in the general workforce reported that the aforementioned psychosocial interventions revealed a significantly small overall effect size for improving work engagement (Hedges g=0.29, 95% CI = 0.12 to 0.46).[21] However, this meta-analysis included non-randomised controlled trials (RCTs). An RCT design minimises bias and confounding factors that are more likely to affect non-RCTs. In the context of work engagement interventions, RCTs ensure that the effects of interventions can be attributed to the intervention itself rather than to external factors.[8] Therefore, the results of this meta-analysis should be interpreted with caution. Additionally, only one study conducted among nurses was included in this meta-analysis. The results of systematic reviews and meta-analyses of interventions aimed at improving work engagement in the general workforce may not apply to nurses. Nurses operate in occupation-specific work cultures and environments compared with the general workforce. The effects of these interventions may differ. Therefore, a systematic review and meta-analysis of nurse-specific intervention studies is required. However, to the best of our knowledge, there have been no systematic reviews or meta-analyses of intervention studies using RCTs to improve nurses' work engagement. A previous systematic review in nursing reported the factors influencing work engagement among nurses; however, it did not comprehensively assess the intervention effects.[8] Another systematic review indicated updating antecedents for improving nurses' work engagement; however, it did not focus on the impact of psychosocial interventions targeting nurses.[22] Evidence on the effectiveness of interventions in improving nurses' work engagement is limited. Improving nurses' work engagement is a pressing issue in the nursing workplace, and a systematic review and meta-analysis of interventions is required for a comprehensive understanding and evidence-based implementation of these interventions.

Therefore, this study aimed to evaluate the effectiveness of interventions designed to improve nurses' work engagement in the workplace. This study reviews RCTs to examine the effectiveness of interventions. This review will provide healthcare organisations with evidence-based recommendations to enhance work engagement among nurses, ultimately leading to better well-being, reduced burnout and improved quality of patient care. These findings will also help guide the development of future interventions and policies in healthcare settings.

METHODS AND ANALYSIS

Study design

This systematic review and meta-analysis of intervention trials (RCTs) will adhere to the methodological framework of the Cochrane Handbook for Systematic Reviews of Interventions.[23] This study protocol has been reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Protocols (PRISMA-P) guidelines[24] (see online supplemental file 1). The results are presented in accordance with the PRISMA statement.[25] The study protocol was officially registered with PROSPERO (registration number: CRD42024510479). The study is planned to begin in August 2025 and will be completed by July 2028. This timeline includes the literature search, data extraction, analysis and reporting phases.

Eligibility criteria

The participants, interventions, comparisons and outcomes (PICO) of the studies included in this systematic review and meta-analysis are as follows: (P) all nurses, (I) psychosocial interventions, (C) no intervention or not an intervention aimed at improving work engagement and (O) work engagement as a primary outcome. This study will include RCTs conducted on a population of nurses regardless of their rank or years in nursing service. The review will also incorporate studies that focused solely on nurses screened for low work engagement, if any, and will conduct subgroup analyses of these studies alone. Studies that involved practical nurses or nursing aides and those that included other healthcare workers, such as doctors, will be excluded. There are no exclusion criteria regarding participants' employment status or the healthcare settings in which they are employed.

This study will include psychosocial interventions designed to enhance nurses' work engagement. Psychosocial interventions are defined as interventions that focus on psychological and social factors, such as support from supervisors and coworkers, attempts to increase job discretion, feedback from supervisors, resiliency training, leadership training and stress management skills to improve individuals' thoughts, behaviours and workplace social relationships.[26]

Comparisons are defined as a no-intervention group, waitlist control, treatment as usual (such as education or training provided by the nursing association, but not interventions specifically targeting work engagement) or alternative interventions (not aimed at improving work engagement).

The aspects of the outcome (ie, work engagement) are assessed using self-reported measures such as the Utrecht Work Engagement Scale.[27 28] This systematic review and meta-analysis will include studies that calculated total scores for work engagement. Work engagement is a concept opposing burnout; however, work engagement scores cannot be estimated from burnout scores measured using, for example, the Maslach Burnout Inventory-General Survey (MBI-GS).[29] Therefore, studies

that used the MBI-GS will be excluded. In addition, we plan to include only studies that measured work engagement as the primary outcome. This approach ensures that our analysis focuses on evaluating the direct effects of interventions designed to improve work engagement among nurses. Studies in which work engagement was measured as a secondary outcome, along with other objectives, will be excluded. Moreover, studies that did not conduct statistical analyses to examine the effects of the intervention will be excluded.

This review focuses exclusively on RCTs owing to their ability to provide the highest level of evidence for evaluating the efficacy of interventions. By limiting the inclusion to RCTs, we intend to ensure a high level of evidence and consistency across the studies, allowing for more reliable conclusions regarding the effectiveness of interventions aimed at improving work engagement among nurses. Although non-randomised studies can provide useful insights, they will be excluded from this review to maintain the rigour of the analysis. Systematic reviews and meta-analyses focusing on RCTs provide the highest level of evidence that is critical for informing practice and policy decisions.[30]

In this study, the search is limited to English and Japanese literature. This is because English is widely used as an international academic language, and several studies have been published in English. In addition, all members of the research team are Japanese and can accurately evaluate and interpret the Japanese literature. This minimises the influence of translation errors and ensures consistency in data interpretation.

This systematic review and meta-analysis will include studies that aimed to evaluate the effect of interventions on improving nurses'' work engagement, used an RCT design and provided sufficient data (sample sizes, means and SDs) to calculate the effect sizes with 95% CIs and are published as original articles written in English or Japanese.

Information sources, search strategy and data management

Systematic searches of published studies will be performed by September 2025 using multiple electronic databases, including the Cochrane Central Register of Controlled Trials (CENTRAL), PubMed (MEDLINE), Embase, CINAHL, PsycINFO, PsycARTICLES and the Japan Medical Abstracts Society. The search terms will encompass those relevant to the PICO criteria. Specific search terms and strategies are outlined in online supplemental file 2 and are available online. All identified studies are managed using Microsoft Excel (Microsoft, Redmond, Washington, USA). Before the study selection process, duplicate citations in Excel files will be removed by KK, the first author. All decisions regarding this study will be documented.

Study selection process

The study selection process has two stages. In the first stage, KK and AI will independently screen for studies based on the inclusion criteria. They will review the titles and abstracts of the studies and assess their eligibility based on previously established criteria. In the second stage, the full texts of eligible studies will be obtained and reviewed using a standard form to determine their eligibility for inclusion. Any discrepancies in the assessment will be recorded, and if they cannot be resolved, they will be addressed through discussions among all authors. The reference lists of the studies will be carefully examined for any additional eligible studies, and the corresponding authors of the eligible studies will be contacted if the results of the publication are unclear and may have multiple interpretations or if the reported results do not include data relevant to our analysis. A flowchart illustrating the review process will be presented.

Data extraction

Two review authors (KK and AI) will independently extract data from the included studies using a standardised data extraction form. Any disagreements or inconsistencies will be recorded and resolved through discussion among all authors until a consensus is reached. The extracted data will include the source (ie, database, journal and year of publication), country where the study was conducted, number of participants included in the analysis, sampling framework, participants' demographic characteristics (ie, mean age, sex proportions, years of nursing experience and employment status), number of participants who were excluded or lost to follow-up, contents of the intervention programme, control condition (ie, no intervention, waiting-list control or other), outcome variables, length of follow-up and sufficient data (ie, the number of participants in each group (N), mean differences (MD) between groups and SD for the outcome) to calculate the effect size with 95% CIs to determine the effect of interventions on the work engagement of nurses. This extraction format is experimental and can be modified as required. Relevant research teams will be contacted regarding the availability of unpublished and missing data.

Risk-of-bias assessment

Two review authors (KK and AI) will independently assess the methodological quality of the included studies using the Grading of Recommendation Assessment, Development and Evaluation (GRADE) approach, which is the Cochrane Collaboration's risk-of-bias tool 2.[31] This tool evaluates possible sources of bias in intervention studies based on the following five categories: (1) bias arising from the randomisation process, (2) bias owing to deviations from intended interventions, (3) bias owing to missing outcome data, (4) bias in outcome measurement and (5) bias in the selection of reported results. Each category will be evaluated based on its risk of bias, with a determination of low risk, some concern or high risk of bias. In addition, the tool evaluates the overall risk of bias by using the GRADE approach to rate confidence in the evidence. All authors will discuss and resolve any inconsistencies in the quality assessment.

Publication bias will be evaluated using funnel plots to assess meta-bias for asymmetry, as well as Egger's test.

Data synthesis and statistical methods

The included studies are statistically synthesised using meta-analysis to estimate the pooled effect (SMD) of interventions aimed at improving nurses' work engagement. Therefore, we plan to combine studies with similar follow-up periods. We will consider the effects over the following follow-up periods: (1) up to 1 month, (2) from 1 to 6 months and (3) over 6 months. We will produce forest plots of the between-group and post-intervention effect sizes for work engagement, along with 95% CIs. The number of participants and their scores, such as the means and SDs for the intervention and control groups for work engagement, will be entered into the Review Manager.[32] The magnitude of the effect size is interpreted as small (0.2), medium (0.5) or large (0.8), according to established criteria.[33]

A meta-analysis will be performed when at least three eligible studies are identified. If performing a meta-analysis (ie, fewer than three studies are eligible and included) is inappropriate, the results will be presented in a narrative form. Publication bias will be examined using funnel plots and Egger's test. Statistical heterogeneity will be assessed using the chi-square (χ^2) test with Cochran's Q statistic and I^2 value.[34] I^2 values of 25%, 50% and 75% indicate low, medium and high heterogeneity, respectively.[35] An I^2 value of≥50% indicates considerable heterogeneity. If there is little or no statistical heterogeneity (ie, an I^2 value of less than 50%) in a comparison, we will pool the results using a fixed-effects model. If the I^2 statistic is greater than 50%, a random-effects model will be used.[36]

As the effects of work engagement interventions may differ according to typology, subgroup analyses will be conducted to compare the results. The major possible grouping characteristics will include the following four categories of work engagement interventions: (1) job resource building, (2) personal resource building, (3) leadership training and (4) health promotion.[19 20] Each category is treated as another stratification factor, and any subgroup differences will be reported and explained. Moreover, we will conduct subgroup analyses of studies that exclusively focus on nurses screened for low work engagement. To assess the effect of the risk of bias on the pooled results, a sensitivity analysis will also be conducted for the included studies classified as low risk according to the Cochrane Collaboration's risk-of-bias tool.[37] All extracted data and analysed results have been deposited by the corresponding author and are available to the external reviewers upon request.

Patient and public involvement statement

None.

Ethics and dissemination

Given that this systematic review and meta-analysis is based on existing studies, it is exempt from ethical approval. The outcomes and findings of this study will be disseminated through publications in peer-reviewed international journals and presentations at conferences, symposia and seminars related to the field.

STRENGTHS AND LIMITATIONS

The greatest strength of this study is that, to the best of our knowledge, it will be the first systematic review and meta-analysis to provide evidence of the effects of interventions aimed at improving nurses' work engagement in the workplace. If this meta-analysis confirms the positive impact of such interventions, the findings will support broader dissemination and implementation of strategies to improve work engagement among nurses. Because nurses' work engagement is positively associated with outcomes at individual, organisational and patient care levels,[8 9 15] these insights will further contribute to enhanced health and well-being of nurses, better organisational performance within healthcare institutes and perhaps better healthcare outcomes for patients.

However, this study has certain limitations. First, the generalisability of our findings may be limited by the demographic characteristics of the participants included in the studies. Second, limiting the article search to only two languages may result in the exclusion of relevant data published in other languages. Third, the accuracy of the systematic reviews and meta-analyses could be affected by publication bias, as high-quality studies with non-significant findings may be less likely to be published. To mitigate this bias, it is essential to contact relevant research teams to inquire about the availability of unpublished or missing data.

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Contributors The study was conceived and designed by KK, and KI and NK supervised this study. The initial draft of the manuscript was written by KK, and all authors including AI revised it critically for important intellectual content and contributed to the final manuscript. All authors read and approved the final manuscript. The entire study process (ie, the data collection, assessment and synthesis) will be conducted by all the authors. The guarantor of this study is KK.

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Competing interests KI and NK are employed at the Department of Digital Mental Health, an endowment department supported with an unrestricted grant from 15 enterprises (https://dmh.m.u-tokyo.ac.jp/c) outside the submitted work. NK obtained personal fees from the Junpukai Foundation outside the submitted work. Other authors did not have any statements.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

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