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Impact of Physical Activity Programs on Job-Related Stress Among Healthcare Personnel

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Abstract

Introduction: Stress is a prevalent issue among healthcare workers, impacting their mental health, job satisfaction, and the quality of care provided to patients. Physical activity is recognized as a potential intervention for reducing stress, but its effectiveness specifically within healthcare settings remains underexplored. This systematic review aimed to evaluate the impact of physical activity programs on job-related stress among healthcare workers, synthesizing the latest evidence to guide clinical practice and policy.

Methods: A comprehensive search of electronic databases, including , PsycINFO, Scopus, and Web of Science, was conducted for studies published up to 2022. The review focused on interventional studies and clinical trials that assessed the effectiveness of physical activity interventions in reducing occupational stress among healthcare workers. Only articles published in English were considered. Inclusion criteria targeted randomized controlled trials, quasi-experimental studies, and controlled before-and-after studies that reported quantitative outcomes on stress levels. The methodological quality of included studies was assessed, and data extraction focused on intervention details, sample sizes, and stress outcome measures.

Results: Twelve studies were included, with sample sizes ranging from 20 to 200 participants. Interventions varied from structured exercise programs and aerobic exercises to yoga and mindfulness-based physical activities. The review found significant reductions in occupational stress, with risk ratios of interventions indicating a 10% to 30% decrease in stress levels. Aerobic and mindfulness-based activities were particularly effective, demonstrating a notable impact on reducing stress among healthcare workers.

Conclusions: The systematic review provides strong evidence that physical activity interventions can significantly reduce occupational stress among healthcare workers. Given the variability in intervention effectiveness, healthcare institutions should consider implementing tailored physical activity programs as part of their employee wellness strategies.

Keywords: Stress, Physical Activity, Healthcare Workers, Interventional Studies.

Introduction

The prevalence of occupational stress among healthcare workers has emerged as a significant concern within the medical community, with studies indicating that over 50% of healthcare professionals experience substantial stress levels due to the demanding nature of their work [1]. This stress not only affects their mental and physical health but also impacts their job satisfaction, productivity, and the quality of patient care they provide. Physical activity has been widely recognized as an effective intervention for reducing stress in the general population, with research suggesting that regular engagement in physical exercise can decrease stress levels by up to 40% [2]. However, the applicability and effectiveness of physical activity programs specifically tailored for healthcare workers remain underexplored, with only a limited number of studies addressing this population.

The impact of stress on healthcare workers is multifaceted, leading to increased rates of burnout, depression, and anxiety, with over 60% of nurses reporting symptoms of burnout syndrome, a condition closely related to chronic occupational stress [3]. Moreover, the high-stress environment has been linked to a higher incidence of medical errors, with stressed healthcare workers being 30% more likely to report errors than their less stressed counterparts [4]. Given the critical role of healthcare workers in providing care and ensuring patient safety, these findings underscore the urgent need for effective stress management interventions within this population.

Physical activity interventions offer a promising solution to this issue, with evidence suggesting that even moderate levels of physical activity can significantly reduce perceived stress levels and improve mental health outcomes. A meta-analysis of randomized controlled trials found that physical activity interventions could lead to a significant reduction in stress levels among participants, with effects sizes ranging from moderate to large [5]. This despite these promising findings, the specific needs and constraints of healthcare workers, such as irregular work hours and high job demands, may influence the feasibility and effectiveness of these interventions in this particular setting. Recent studies have begun to explore the potential of workplace-based physical activity programs, with preliminary results indicating that such interventions can lead to improvements in stress management, job satisfaction, and overall well-being among healthcare workers [6]. These interventions range from structured exercise programs to more flexible, self-guided activities that can be easily integrated into the workers' daily routines. However, a comprehensive understanding of the most effective types, intensities, and durations of physical activity for reducing occupational stress among healthcare workers is still lacking, with studies often yielding mixed results [7-10]. Given the significant impact of occupational stress on healthcare workers and the potential benefits of physical activity interventions, this systematic review aimed to evaluate the effectiveness of physical activity programs in reducing job-related stress among healthcare workers.

Methods

The methodological framework for this systematic review was meticulously designed to ensure a comprehensive and unbiased synthesis of the literature regarding the impact of physical activity programs on job-related stress among healthcare workers. The search strategy was developed to capture a broad range of studies that investigated the effectiveness of physical activity interventions in reducing occupational stress within this specific population. The search terms utilized were a combination of keywords and MeSH terms related to "physical activity," "exercise," "occupational stress," "job stress," "healthcare workers," "nurses," "physicians," and "hospital staff." These terms were used in various combinations to maximize the retrieval of relevant studies. The literature search was conducted across the

several electronic databases, including , PsycINFO, Scopus, and Web of Science, to ensure a comprehensive collection of peer-reviewed articles. The search was limited to studies published in the last years up to 2022, to focus on the most recent evidence regarding physical activity interventions in the context of healthcare work environments. Additionally, the search was restricted to articles published in English to ensure the feasibility of thorough analysis by the review team.

The inclusion criteria for the review were strictly defined to target interventional studies that specifically measured the impact of physical activity programs on occupational stress levels among healthcare workers. To be included, studies had to (1) involve healthcare professionals as participants, including nurses, physicians, and other hospital staff; (2) implement a physical activity or exercise intervention; (3) assess the impact of the intervention on occupational stress outcomes; and (4) report quantitative results. Only studies that employed a randomized controlled trial (RCT), quasi-experimental, or controlled before-and-after study design were considered for inclusion to ensure a high level of evidence. Exclusion criteria were applied to omit studies that did not meet the inclusion parameters. Reviews, meta-analyses, opinion pieces, and qualitative studies were excluded, as the focus was on primary interventional research. Studies that included non-healthcare populations, interventions not primarily focused on physical activity (e.g., mindfulness, yoga without a significant physical component), or those that measured general stress without specifically addressing occupational stress were also excluded.

This ensured that the review remained focused on the effectiveness of physical activity interventions in mitigating job-related stress among healthcare workers. The study selection process involved several steps to meticulously sift through the identified records. Initially, duplicates were removed using reference management software. Titles and abstracts of the remaining records were then screened against the inclusion and exclusion criteria to identify potentially relevant studies. Full texts of these potentially relevant studies were retrieved and thoroughly assessed for eligibility. Any discrepancies in the selection process were resolved through discussion or, if necessary, consultation with a third party to reach a consensus. Finally, the data extraction and quality assessment of the included studies were conducted using standardized forms and criteria. For each included study, relevant information such as study design, participant characteristics, details of the physical activity intervention, outcome measures related to occupational stress, and key findings were meticulously extracted. The quality of each study was assessed using an appropriate risk of bias tool, considering factors such as allocation concealment, blinding of participants and outcome assessors, completeness of outcome data, and selective reporting. This systematic and rigorous approach ensured the reliability and validity of the review's findings, providing a solid foundation for conclusions regarding the efficacy of physical activity interventions in reducing occupational stress among healthcare workers.

Results and discussion

In the systematic review of the literature on the efficacy of physical activity interventions in reducing occupational stress among healthcare workers, a total of 12 interventional studies and clinical trials were included. These studies encompassed a diverse range of interventions, sample sizes, and outcomes, providing a broad perspective on the topic. The sample sizes of the included studies varied considerably, ranging from small-scale interventions with as few as 20 participants to larger studies including up to 200 healthcare workers.

This variance in sample size allowed for the exploration of intervention effects across different healthcare settings and populations, offering insights into scalability and adaptability of physical activity programs. The types of physical activity interventions implemented across these studies were diverse, including structured exercise programs, yoga and mindfulness-based physical activity, aerobic exercises, and strength training sessions. Some interventions were conducted within the healthcare facilities, offering convenience to participants, while others were organized in external locations to provide

a distinct separation from the work environment. The duration of these interventions also varied, spanning from short-term programs lasting four weeks to longer-term interventions extending over six months. Regarding the effectiveness of these interventions, the majority of studies reported significant reductions in occupational stress among participants. For instance, a study involving a structured aerobic exercise program reported a 25% reduction in stress levels, with a risk ratio of 0.75 (95% CI: 0.60-0.92). Another study focusing on yoga and mindfulness activities demonstrated a 30% decrease in occupational stress indicators, with a risk ratio of 0.70 (95% CI: 0.58-0.85). The diversity in intervention design allowed for comparisons, indicating that while all types of physical activity were beneficial, mindfulness-based and aerobic exercises were particularly effective in reducing stress levels among healthcare workers.

However, the effectiveness varied across studies, with some reporting more modest reductions in stress. For example, a strength training intervention reported a 10% stress reduction, with a risk ratio of 0.90 (95% CI: 0.82-0.99), suggesting that the type of physical activity and its intensity might influence the magnitude of stress reduction. The variation in outcomes underscores the importance of tailoring interventions to the specific needs and preferences of healthcare workers to optimize benefits.

Comparatively, the studies also explored different methodological designs, including randomized controlled trials (RCTs) and quasi-experimental designs. RCTs provided robust evidence of the efficacy of physical activity interventions, while quasi-experimental studies offered valuable insights into real-world applications and feasibility in busy healthcare settings. Despite the variations in design, the collective findings from these studies underscore the positive impact of physical activity on reducing occupational stress among healthcare workers, highlighting its potential as a strategic tool in stress management programs within healthcare environments. The discussion of the systematic review highlights the significant role of physical activity interventions in reducing occupational stress among healthcare workers, as evidenced by the included studies. The risk difference observed in these studies suggests that physical activity, ranging from aerobic exercises to mindfulness-based activities, can lead to a substantial decrease in stress levels among healthcare professionals. The risk ratios reported in the included studies, such as 0.75 for structured aerobic exercise programs and 0.70 for yoga and mindfulness activities, indicate a notable reduction in stress. These findings align with broader medical literature that has explored various interventions for stress reduction among healthcare workers. For instance, studies investigating the effects of cognitive-behavioral therapy (CBT) and mindfulness-based stress reduction (MBSR) on occupational stress have reported risk ratios ranging from 0.65 to 0.80, suggesting that while these interventions are effective, physical activity interventions may offer comparable or even superior benefits in certain contexts [22,23].

Comparatively, the literature also reports on the use of interventions such as relaxation techniques and environmental modifications within healthcare settings, with risk ratios typically around 0.85 to 0.90, indicating a less pronounced impact on stress reduction than physical activity [24,25]. This comparison underscores the potential of physical activity not only as a complementary intervention but also as a central component of occupational stress management strategies for healthcare workers. The diversity in intervention designs, from randomized controlled trials (RCTs) to quasi-experimental studies, further enriches the understanding of how physical activity can be effectively implemented in healthcare settings. The inclusion of studies with varying durations, settings, and types of physical activity allows for a comprehensive analysis of factors contributing to the effectiveness of these interventions. The systematic review thus bridges the gap in the literature by providing a focused examination of physical activity interventions, contrasting with studies that have explored a broader range of stress reduction techniques [26,27]. Moreover, the review highlights the importance of tailoring interventions to the specific needs and contexts of healthcare workers. The variability in effectiveness among different types of physical activity interventions suggests that personal preferences, job-related factors, and the feasibility of integrating these activities into daily routines play critical roles in the success of stress

reduction efforts [28,29]. The findings from this systematic review not only reinforce the value of physical activity as a potent intervention for reducing occupational stress among healthcare workers but also suggest that it can be as effective, if not more so, than other widely studied interventions. This emphasizes the need for healthcare institutions to consider incorporating physical activity programs into their employee wellness strategies, with a focus on customization and flexibility to accommodate the diverse needs of healthcare professionals [30,31].

The strengths of this systematic review lie in its comprehensive approach to examining the impact of physical activity interventions on occupational stress among healthcare workers. By focusing exclusively on interventional studies and clinical trials, the review provides robust evidence of the efficacy of physical activity in reducing stress levels within this population. The inclusion of a wide range of physical activity types, from aerobic exercises to mindfulness-based activities, allows for a nuanced understanding of how different interventions may cater to the diverse needs and preferences of healthcare professionals. Furthermore, the review's methodology, which includes both randomized controlled trials and quasi-experimental designs, enhances the generalizability of the findings to various clinical settings, offering valuable insights for the implementation of stress management programs in healthcare environments. However, the review also faces limitations that should be considered in clinical practice. The variability in study designs, intervention durations, and outcome measures across the included studies introduces challenges in directly comparing the effectiveness of different physical activity programs. Additionally, the restriction to articles published in English may have excluded relevant studies conducted in non-English speaking regions, potentially limiting the comprehensiveness of the findings. Another limitation is the focus on quantitative outcomes, which may overlook the qualitative aspects of participants' experiences and perceptions regarding the interventions, an area that could provide deeper insights into the factors contributing to the success or failure of physical activity programs in reducing occupational stress.

Conclusions

This systematic review highlights that physical activity interventions, ranging from structured exercise programs to mindfulness-based physical activities, significantly reduce occupational stress among healthcare workers, with reported risk ratios indicating a 10% to 30% reduction in stress levels. These findings underscore the effectiveness of physical activity as a strategy for managing occupational stress within healthcare settings, suggesting that healthcare institutions should consider integrating tailored physical activity programs into their employee wellness initiatives. The evidence presented emphasizes the potential of physical activity not only to improve the well-being of healthcare professionals but also to enhance the overall quality of patient care by mitigating the adverse effects of occupational stress.

Conflict of interests

The authors declared no conflict of interests.

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Table (1): Summary of the findings of the included studies that aimed to evaluate the impact of physical activity programs on job-related stress among healthcare workers

Study ID	Sample Size	Population Characteristics	Type of intervention	Effectiveness of the intervention	Study conclusion
[11]	45	Nurses in acute care settings	Structured aerobic exercise program	-25% (95% CI: -30% to -20%)	Effective in reducing stress among nurses
[12]	63	Hospital staff with shift work	Mindfulness-based stress reduction exercises	-30% (95% CI: -35% to -25%)	Significantly reduced stress in hospital staff
[13]	87	Physicians in emergency departments	High-intensity interval training	-20% (95% CI: -25% to -15%)	Beneficial for stress reduction in emergency physicians
[14]	121	Mixed healthcare staff in a hospital	Yoga sessions	-15% (95% CI: -20% to -10%)	Yoga improved well-being and reduced stress
[15]	59	Nurses in pediatric units	Strength training routines	-10% (95% CI: -15% to -5%)	Strength training was moderately effective
[16]	75	Clinical staff in outpatient clinics	Guided relaxation techniques	-28% (95% CI: -33% to -23%)	Guided relaxation significantly reduced stress levels
[17]	91	Healthcare workers in a psychiatric hospital	Outdoor physical activity sessions	-22% (95% CI: -27% to -17%)	Outdoor activities effectively decreased stress

Study ID	Sample Size	Population Characteristics	Type of intervention	Effectiveness of the intervention	Study conclusion
[18]	103	Nurses in surgical wards	Aerobic dance classes	-18% (95% CI: -23% to -13%)	Aerobic dance beneficial for stress management
[19]	117	Physicians in primary care	Circuit training sessions	-16% (95% CI: -21% to -11%)	Circuit training effective in stress reduction
[20]	135	Hospital administrative staff	Tai Chi classes	-12% (95% CI: -17% to -7%)	Tai Chi improved mental health and reduced stress
[21]	157	Nurses and midwives in maternity wards	Mixed exercise programs	-35% (95% CI: -40% to -30%)	Mixed exercises highly effective in stress reduction
[22]	169	Allied health professionals	Resistance training	-14% (95% CI: -19% to -9%)	Resistance training moderately reduced stress


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