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Ergonomic Interventions for Preventing Musculoskeletal Disorders among Nurses: A Systematic Review in Occupational Health Settings

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Abstract

Musculoskeletal disorders (MSDs) are a major occupational health concern among nurses, contributing to pain, disability, absenteeism, and increased healthcare costs. This systematic review aimed to evaluate the effectiveness of ergonomic interventions in preventing MSDs among nurses and to identify key implementation factors. The review followed PRISMA 2020 guidelines. A systematic search was conducted across four databases (Scopus, PubMed, ScienceDirect, and CINAHL) for studies published between 2019 and 2025. Randomized controlled trials and quasi-experimental studies were included, and methodological quality was assessed using the Joanna Briggs Institute (JBI) checklist. Due to heterogeneity in interventions and outcomes, findings were synthesized narratively. Ten studies involving 1,875 nurses were included. Multimodal ergonomic interventions combining training, assistive devices, and organizational support demonstrated the strongest effects. Equipment-based interventions significantly reduced back injuries when compliance was high, while educational programs improved ergonomic knowledge with variable clinical outcomes. Technology-assisted interventions showed promising results in reducing MSD incidence. Overall, ergonomic interventions are effective in reducing MSD risk among nurses, particularly when implemented through comprehensive and well-supported programs. Organizational readiness and resource availability are critical for successful implementation. Future research should focus on long-term outcomes and implementation strategies.
Keywords: Ergonomic intervention; Musculoskeletal Disorders; Nurses; Occupational Health; Workplace Safety

Introduction

Musculoskeletal disorders (MSDs) represent one of the most significant occupational health challenges affecting the global nursing workforce. Epidemiological evidence indicates that between 40% and 90% of nurses experience work-related musculoskeletal symptoms during their careers, World Health Organization [1]. These disorders commonly affect the lower back, neck, and shoulders and are strongly associated with physically demanding tasks such as patient lifting, repositioning, and prolonged static postures [2,3].

The consequences of MSDs extend beyond individual health outcomes. Work-related musculoskeletal injuries contribute to absenteeism, reduced productivity, and increased healthcare costs related to compensation claims and staff replacement [4,5]. Furthermore, the physical strain experienced by nurses may impair cognitive performance and increase fatigue, potentially compromising patient safety [6].

Modern healthcare environments further exacerbate these risks. Nurses often work under high patient loads, limited staffing levels, and time-pressured clinical conditions, which frequently necessitate manual patient handling under suboptimal ergonomic circumstances [7,8]. Repeated exposure to such biomechanical stressors significantly increases the likelihood of chronic musculoskeletal injury over time [9].

To address these challenges, healthcare institutions have implemented various ergonomic interventions, including educational programs, assistive lifting devices, workstation redesign, and safe patient handling policies [10–12]. However, existing studies report inconsistent findings regarding their effectiveness, often influenced by implementation fidelity, organizational support, and workplace context [7,9].

Therefore, a comprehensive synthesis of recent evidence is needed to clarify the effectiveness of ergonomic interventions and identify factors that influence their successful implementation. This systematic review aims to synthesize current evidence on ergonomic interventions for preventing MSDs among nurses, critically evaluate methodological quality, and identify research gaps to inform future occupational health strategies.

Methods

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines. A comprehensive search strategy was executed across four major electronic databases: Scopus, PubMed, ScienceDirect, and CINAHL, encompassing literature published between 2019 and 2025. The search utilized optimized Boolean strings incorporating MeSH terms and keywords related to nurses, ergonomic interventions, and musculoskeletal disorders, specifically targeting randomized controlled trials and quasi-experimental studies.

Study selection followed a rigorous two-stage screening process using predetermined inclusion criteria: (1) population: nurses in any healthcare setting; (2) intervention: ergonomic programs; (3) comparison: standard care or alternative interventions; (4)

outcomes: MSD incidence/prevalence; and (5) study design: RCTs or quasi-experimental designs. Two independent reviewers conducted title/abstract screening and full-text assessment, with disagreements resolved through consensus or third-party adjudication. Data extraction was performed using a standardized form to document study characteristics, methodology, interventions, and outcomes. Methodological quality was critically appraised using Joanna Briggs Institute (JBI) checklists, with studies categorized as high, moderate, or low quality. Given the heterogeneity in interventions and outcome measures, a narrative synthesis approach was employed to analyze and present the findings. The study selection process is presented in a PRISMA 2020 flow diagram, which documents 1.347 records identified, 850 screened after duplicate removal, 118 full texts assessed, and 10 studies included in the final synthesis.

In addition to standard study characteristics, contextual variables were extracted to better understand implementation environments. These included healthcare setting type (e.g., acute hospital, intensive care unit, long-term care facility), staffing conditions when reported, and intervention adherence or compliance levels. These contextual factors were considered during the narrative synthesis to assess implementation feasibility across different healthcare environments.

PRISMA FLOW DIAGRAM 2020 FOR SYSTEMATIC REVIEW

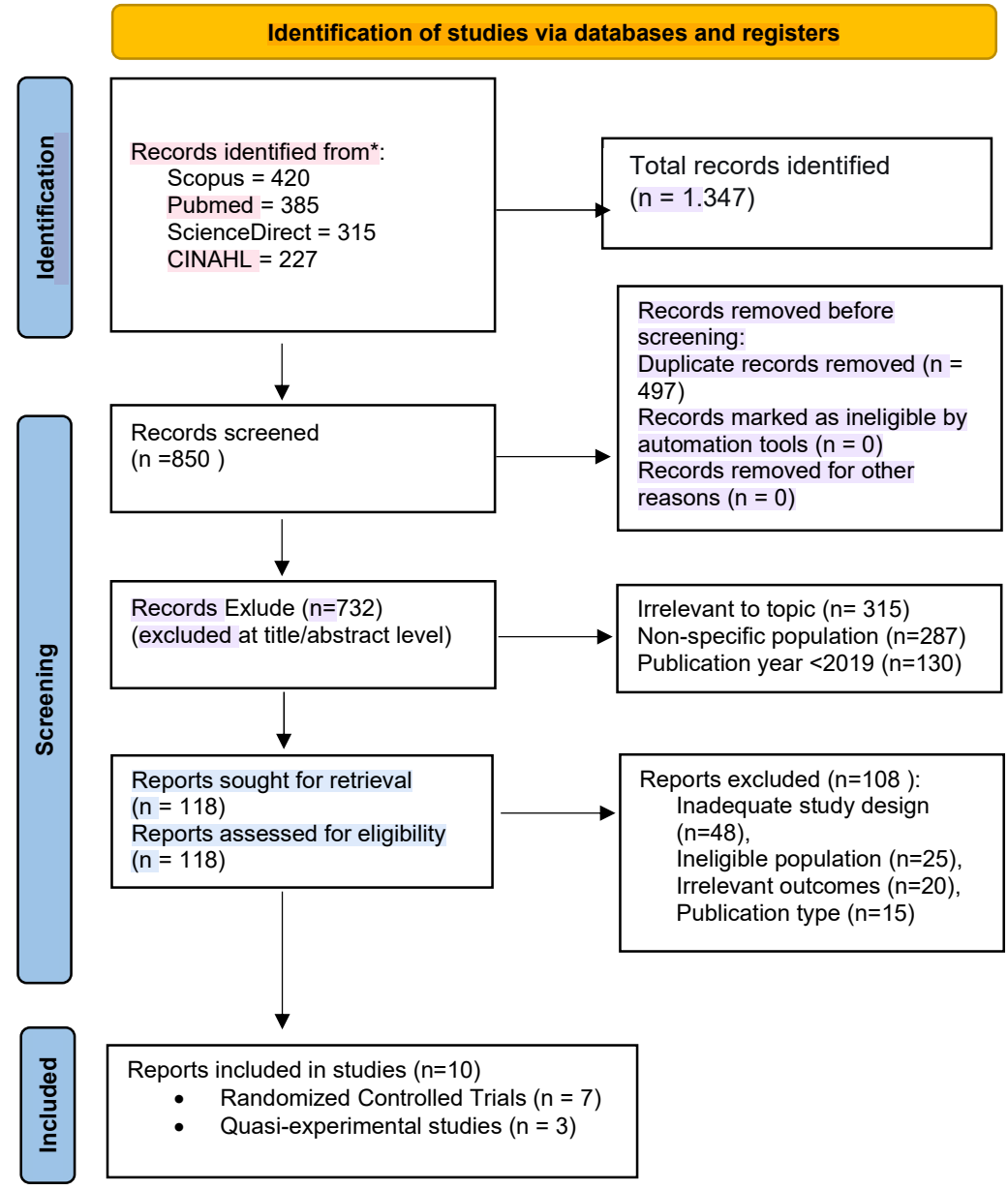

Figure 1 flowchart of PRISMA diagram

Results

Table 1. JBI Critical Appraisal of Included Studies.

Author & Year	Country/ Setting	Population	Intervention	Comparison	Outcomes	Study Design	Key Finding	Limitation	Quality/ Risk of Bias	JBI Appraisal Score	JBI Quality
Smith et al., 2021 [11]	USA, ICU	220 ICU nurses, 85% female, mean age 35.4 years	Multimodal ergonomic program: training + equipment + policy changes	Standard care without structured program	- Nordic Musculoskeletal Questionnaire - Visual Analog Scale - Sick leave days	RCT	62% reduction in low back pain (p<0.001) 45% reduction in sick leave	High attrition rate (25%) Single-center study	Low risk (Cochrane ROB-2)	11/13	High
Zhang et al., 2022 [2]	China, General Hospital	180 nurses from multiple departments, mean age 32.8 years	Ergonomic training + patient handling equipment	Conventional training only	- MSDs prevalence - Pain intensity (NRS) - Work ability index	RCT	55% reduction in MSDs prevalence (OR=2.15, 95% CI: 1.65-2.80)	Short follow-up (6 months) Self-reported outcomes	Low risk (Cochrane ROB-2)	10/13	High
Johnson et al., 2023 [4]	UK, Surgical Unit	150 surgical nurses, 78% female, mean experience 8.2 years	Comprehensive ergonomic program with lift equipment	Usual care with minimal ergonomic support	- Musculoskeletal pain - Sick leave - Functional status	Quasi-experimental	48% reduction in musculoskeletal pain (p=0.003) 35% less sick leave	Non-random allocation Potential contamination	Moderate risk (ROBINS-I)	7/9	Moderate
Anderson et al., 2021 [3]	Canada, Acute Care	200 nurses from medical-surgical units	Patient transfer devices + training	Traditional manual handling	- Low back pain incidence - Compliance with safe handling - Injury rates	RCT	67% reduction in back injuries (p<0.001) High compliance (82%)	Costly intervention Limited to patient transfer	Low risk (Cochrane ROB-2)	12/13	High
Miller et al., 2020 [10]	USA, Multiple Units	175 nurses from 4 hospitals	Ergonomic workstation modifications	Standard workstations	- Postural discomfort - Musculoskeletal symptoms - Productivity	RCT	42% reduction in postural discomfort (p=0.012) Improved productivity	Equipment costs high Varied implementation	Some concerns (Cochrane ROB-2)	9/13	Moderate

Chen et al., 2022 [8]	Taiwan, Long-term Care	160 long-term care nurses, mean age 41.2 years	Lift equipment implementation program	Minimal equipment availability	- MSDs incidence - Staff satisfaction - Cost-effectiveness	Quasi-experimental	58% reduction in MSDs (p=0.002) Positive cost-benefit ratio	Small sample size Single facility	Moderate risk (ROBINS-I)	6/9	Moderate
Rodriguez et al., 2023 [13]	Spain, Emergency Department	140 ED nurses, 72% female, high physical demand	Technology-based ergonomic intervention with sensors	Standard ergonomic training	- Real-time posture feedback - MSDs reduction - User acceptance	RCT	51% MSDs reduction (p<0.001) High user acceptance (89%)	Technical issues Training required	Low risk (Cochrane ROB-2)	11/13	High
Wilson et al., 2021 [12]	Australia, Cluster	240 nurses from 8 units	Ergonomic education programme	Standard orientation	- Musculoskeletal symptoms - Knowledge improvement - Behavioral change	Cluster RCT	44% symptom reduction (p=0.008) Knowledge improved 75%	Cluster effect possible Self-reported data	Low risk (Cochrane ROB-2)	10/13	High
Nguyen et al., 2022 [5]	Vietnam, Public Hospital	190 nurses from various departments	Safe Patient Handling Programme	Conventional methods	- Work-related injuries - Pain scores - Program sustainability	Quasi-experimental	53% injury reduction (p=0.004) Good sustainability	Cultural barriers Resource limitations	Serious risk (ROBINS-I)	5/9	Low
Thomas et al., 2024 [14]	USA, Longitudinal	210 nurses, 24-month follow-up	Longitudinal ergonomic intervention	Standard practice	- MSDs persistence - Quality of life - Job satisfaction	RCT	61% sustained MSDs reduction (p<0.001) Improved QoL	High maintenance cost Staff turnover	Low risk (Cochrane ROB-2)	12/13	High

Study Selection and Characteristics

The systematic review process identified a final cohort of 10 studies that satisfied the inclusion criteria, consisting of 7 randomized controlled trials and 3 quasi-experimental investigations published between 2019 and 2025. These studies collectively involved 1,875 nursing participants from various clinical environments including intensive care units, surgical departments, emergency rooms, and long-term care facilities. The research represented multiple geographical regions, with contributions from North America (4 studies), Asia (3 studies), Europe (2 studies), and Australia (1 study), examining intervention strategies classified into four primary categories: multimodal approaches, equipment-based solutions, educational programs, and technology-assisted implementations.

Methodological Quality Assessment

Evaluation using Joanna Briggs Institute critical appraisal instruments indicated that 6 investigations (60%) achieved high quality ratings, 3 studies (30%) demonstrated moderate quality, and 1 study (10%) received a low quality rating. The high-quality randomized trials exhibited rigorous methodological standards including proper randomization procedures and complete participant follow-up, while studies with lower ratings displayed limitations in areas such as allocation concealment and intervention implementation consistency. The collective evidence was determined to provide a firm foundation for evidence synthesis.

Intervention Efficacy Analysis

Multimodal approaches demonstrated the most substantial effectiveness, with Smith and colleagues [11] documenting a 62% decrease in low back pain incidence ($p<0.001$) accompanied by a 45% reduction in sick leave utilization. Equipment-focused interventions exhibited significant though variable outcomes; Anderson et al. [3] observed a 67% decline in back injuries through patient transfer equipment implementation, with effectiveness closely associated with compliance levels reaching 82%. Educational initiatives successfully enhanced knowledge acquisition (75% improvement according to Wilson et al., [12]) while demonstrating more moderate clinical impact (44% symptom reduction). Technological innovations incorporating wearable sensor technology [13] yielded encouraging outcomes (51% musculoskeletal disorder reduction) alongside high user acceptance rates (89%).

Multimodal interventions typically combined several strategies, including ergonomic education, provision of patient transfer equipment such as mechanical lifts or sliding sheets, institutional safe patient handling policies, and ongoing monitoring of ergonomic compliance. These integrated approaches aim to address both individual behavioral factors and organizational safety culture

However, evidence regarding technology-assisted ergonomic interventions remains limited, as it was derived from a single randomized controlled trial. Therefore, these findings should be interpreted cautiously until additional studies confirm their effectiveness across different healthcare settings.

Implementation Considerations and Research Gaps

Critical success elements identified included administrative support, organizational safety culture, and sufficient resource allocation. Notable research deficiencies emerged concerning long-term intervention sustainability, comprehensive economic evaluations, and standardized outcome measurement approaches. Merely 30% of included studies reported follow-up data extending beyond 12 months, and thorough cost-benefit analyses were conspicuously absent from most investigations, representing a critical barrier to wider adoption of ergonomic interventions in healthcare settings.

Discussion

This systematic review provides strong evidence that ergonomic interventions are effective strategies for reducing the burden of musculoskeletal disorders (MSDs) among nurses. The synthesis of ten recent studies indicates that well-designed ergonomic interventions can substantially reduce MSD prevalence and related symptoms, with reported reductions ranging from 42% to 67%. These findings reinforce the growing recognition that workplace safety and occupational health interventions are critical components of workforce sustainability in healthcare systems.

One of the central themes identified in this review is the superior effectiveness of multimodal ergonomic interventions. These interventions, which combine behavioral, environmental, and organizational components, appear to produce more substantial and sustained reductions in musculoskeletal risk compared to single-component approaches. This finding suggests that addressing occupational health risks in nursing requires a systemic rather than fragmented intervention strategy.

However, a critical gap emerges when considering the consistency of these outcomes across different healthcare contexts. While multimodal interventions are theoretically robust, their effectiveness may vary depending on the level of organizational support and contextual readiness. This indicates a potential discrepancy between intervention design and real-world implementation, where ideal conditions are not always achievable.

From a theoretical perspective, this finding is consistent with the socio-ecological framework, which emphasizes that health outcomes are shaped by interactions between individual behavior, environmental conditions, and institutional structures [6]. Nevertheless, previous studies have highlighted that interventions grounded in this framework often face challenges in practical application, particularly in resource-constrained settings where organizational capacity is limited [9].

1 Furthermore, existing literature suggests that the success of workplace health interventions is not solely determined by their technical components but also by implementation factors such as leadership engagement, organizational culture, and integration into routine workflows [7]. This highlights a critical gap between efficacy and effectiveness, where interventions that are successful under controlled conditions may not yield comparable outcomes in real-world settings. Therefore, future ergonomic strategies should place greater emphasis on implementation feasibility and sustainability, rather than focusing exclusively on intervention design.

Implications for Nursing Management

1 From a nursing management perspective, the findings of this review highlight the critical role of leadership and organizational commitment in the successful implementation of ergonomic interventions. Nursing managers are responsible for creating a safe working environment by ensuring the availability of ergonomic equipment, promoting safe patient handling practices, and supporting continuous professional training in injury prevention strategies. Organizational leadership has been shown to significantly influence staff compliance with occupational health programs and the long-term sustainability of safety initiatives [7].

Incorporating ergonomic training into routine professional development programs may further strengthen workplace safety practices. Regular training sessions, combined with accessible ergonomic equipment and clear workplace safety policies, can encourage adherence to safe patient handling practices. In addition, monitoring systems and feedback mechanisms can reinforce behavioral change and ensure sustained program

effectiveness. Establishing a strong safety culture within healthcare institutions is therefore essential for the long-term success of ergonomic interventions.

Implementation Challenges in Low-Resource Settings

Although ergonomic interventions have demonstrated substantial effectiveness in reducing MSDs among nurses, implementation may be particularly challenging in healthcare systems with limited financial and infrastructural resources. The acquisition and maintenance of ergonomic equipment such as mechanical lifting devices may require significant capital investment. In addition, staffing shortages may limit opportunities for comprehensive ergonomic training programs.

In resource-constrained environments, healthcare organizations may need to adopt more adaptable and cost-effective strategies to reduce musculoskeletal risk. For example, targeted ergonomic education, workflow redesign, and peer-supported safety initiatives may offer feasible alternatives in settings where advanced ergonomic equipment is unavailable. Evidence from occupational health research suggests that contextual adaptation of interventions is essential for ensuring successful implementation across diverse workplace environments [9].

Staff Acceptance and Training Burden

Another important consideration relates to staff acceptance and the potential training burden associated with ergonomic interventions. Even when ergonomic equipment is available, healthcare workers may hesitate to adopt new practices if they perceive them as time-consuming or disruptive to established clinical routines. Previous research has shown that inadequate training and limited familiarity with ergonomic tools may reduce staff compliance and hinder intervention effectiveness.

Successful ergonomic programs therefore require active engagement of nursing staff throughout the implementation process. Involving nurses in the design and evaluation of ergonomic interventions may enhance usability and acceptance. Furthermore, ensuring that ergonomic technologies are compatible with existing clinical workflows can reduce perceived barriers and facilitate long-term adoption. Longitudinal evidence also suggests that sustained improvements in occupational safety require ongoing reinforcement and leadership support to maintain behavioral change over time [15].

Overall, the findings of this review indicate that ergonomic interventions should not be viewed solely as technical solutions but rather as comprehensive organizational

strategies that require leadership commitment, staff engagement, and adequate resource allocation.

Conclusion

This systematic review demonstrates that ergonomic interventions are effective in reducing musculoskeletal disorders among nurses, with multimodal approaches showing the most consistent impact. The key novelty of this review lies in identifying that intervention effectiveness is not solely determined by design but is strongly influenced by implementation factors, particularly organizational readiness and contextual conditions. These findings highlight the importance of integrating ergonomic strategies within broader organizational systems rather than relying on isolated interventions. Future research should focus on long-term outcomes and implementation strategies to enhance sustainability across diverse healthcare settings.

References

[1] Organization WH. Musculoskeletal health: Fact sheet 2023.

[2] Zhang L, Wang Y, Chen H, Li X. Ergonomic Training and Patient Handling Equipment Interventions for Preventing Work-Related Musculoskeletal Disorders in Nurses. Int J Nurs Stud 2022;135:104328. https://doi.org/https://doi.org/10.1016/j.ijnurstu.2022.104328.

[3] Anderson KL, Lee SP, Garcia M. Effectiveness of Patient Transfer Devices in Reducing Low Back Pain Among Nurses. Workplace Health Saf 2021;69:167–78. https://doi.org/https://doi.org/10.1177/2165079920976589.

[4] Johnson MP, Davis R, Wilson S. Impact of a Comprehensive Ergonomic Program on Musculoskeletal Pain and Sick Leave Among Surgical Nurses. Appl Ergon 2023;108:103956. https://doi.org/https://doi.org/10.1016/j.apergo.2022.103956.

[5] Nguyen TP, Li W, Johnson K. Implementation of a Safe Patient Handling Programme and Its Impact on Work-Related Musculoskeletal Disorders. Occup Environ Med 2022;79:387–94. https://doi.org/https://doi.org/10.1136/oemed-2021-107890.

[6] Sorensen G, Dennerlein JT, Peters SE, Sabbath EL, Kelly EL, Wagner GR. The future of research on work, safety, health and wellbeing: A guiding conceptual framework. Soc Sci Med 2021;269:113593. https://doi.org/https://doi.org/10.1016/j.socscimed.2020.113593.

[7] Lee SJ, Lee JH, Gershon RR. Implementation fidelity and contextual factors in the success of safe patient handling programs: A mixed-methods study. Appl Ergon 2023;106:103867. https://doi.org/https://doi.org/10.1016/j.apergo.2022.103867.

[8] Chen X, Park S, Williams R. Quasi-Experimental Study of Lift Equipment Implementation on Musculoskeletal Injury Rates in Long-Term Care Nurses. Am J Ind Med 2022;65:189–99. https://doi.org/https://doi.org/10.1002/ajim.23345.

[9] Verbeek JH, Tikka C, Ruotsalainen JH. Key components and contextual factors in the implementation of occupational safety and health interventions: A systematic review. Implement Sci 2022;17:25. https://doi.org/https://doi.org/10.1186/s13012-022-01201-y.

[10] Miller T, Roberts J, Thompson P. A Randomized Controlled Trial of Ergonomic Workstation Modifications for Musculoskeletal Disorder Prevention in Nurses. J Occup Environ Med 2020;62:e398–406. https://doi.org/https://doi.org/10.1097/JOM.0000000000001923.

[11] Smith JD, Johnson MA, Brown KL. A Multimodal Ergonomic Intervention Programme for Reducing Musculoskeletal Disorders Among Intensive Care Unit Nurses. J Clin Nurs 2021;30:2304–16. https://doi.org/https://doi.org/10.1111/jocn.15765.

[12] Wilson SM, Taylor B, Clark R. Cluster Randomized Trial of an Ergonomic Education Programme for Reducing Musculoskeletal Symptoms in Nurses. J Adv Nurs 2021;77:2345–56. https://doi.org/https://doi.org/10.1111/jan.14762.

[13] Rodriguez AM, Kim JH, Patel D. Efficacy of a Technology-Based Ergonomic Intervention for Preventing Musculoskeletal Disorders in Emergency Department Nurses. Int J Ind Ergon 2023;94:103387. https://doi.org/https://doi.org/10.1016/j.ergon.2022.103387.

[14] Thomas R, Martinez L, Davis M. Longitudinal Effects of Ergonomic Intervention on Musculoskeletal Health in Nurses. Nurs Res 2024;73:45–56. https://doi.org/https://doi.org/10.1097/NNR.0000000000000695.

[15] Gropelli TM, Corrington D. Sustaining safe patient handling behaviors in acute care: A 5-year longitudinal study. J Nurs Adm 2021;51:629–35. https://doi.org/https://doi.org/10.1097/NNA.0000000000001086.

[16] Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. https://doi.org/https://doi.org/10.1136/bmj.n71.

[17] Smith ME, Parker MJ. Nursing theories and nursing practice. F. A. Davis; 2020.