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THE IMPACT OF PROFESSIONAL ACTIVITY NURSES HEALTH – RISK FACTORS AND PREVENTION STRATEGIES THROUGH PHYSICAL ACTIVITY AND SUPPORT PROGRAMS

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ABSTRACT. ***Introduction****:* The professional activity of nurses is associated with high physical and psychological demands, which may lead to musculoskeletal disorders and a decrease in professional quality of life. Nursing is recognized for its nobility and importance, but also for the significant physical and mental strain it entails. ***Objectives****:* This study investigates the impact of professional activity on the physical health of nurses, with a focus on the body regions most affected and the symptoms reported, comparing results by sex and age groups. Additionally, it aims to explore the main body areas experiencing discomfort after a workday among nurses. ***Methods****:* An observational questionnaire-based study was conducted on a sample of 12 active nurses. Data were analyzed using descriptive and comparative statistics and are presented in tables and graphs. ***Results****:* The most frequently reported problems were lumbar and cervical pain. Significant differences were observed between sexes and age categories. Overall, 91.7% of participants reported discomfort in one or more body regions, with the cervical region and spine being the most affected. Additional symptoms included water retention, headaches, mental fatigue, and stress. ***Conclusions:*** Professional activity has a major impact on the physical health of nurses. The implementation of occupational health and safety (OHS) and psychological measures, along with further studies on larger samples, may be beneficial. Ergonomic programs and organizational prevention policies are strongly recommended.

Keywords: nurses; musculoskeletal disorders; occupational health; ergonomics; burnout

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INTRODUCTION

The nursing profession plays a central role in healthcare systems worldwide, combining a high level of social responsibility with intense physical and psychological demands. Beyond their essential contribution to patient care, nurses are exposed daily to occupational risks that can have a significant impact on their health and quality of life.

Among these risks, work-related musculoskeletal disorders (WMSDs) stand out as one of the most prevalent health problems. International research consistently shows that the lumbar spine, cervical region, and shoulders are the most frequently affected areas, reflecting the specific demands of nursing practice, such as patient lifting and mobilization, prolonged static postures, and repetitive manual tasks. While global data confirm the endemic nature of WMSDs among nurses, evidence from Romania remains scarce. The lack of detailed national statistics highlights a critical gap in the literature, even though the professional context mirrors international trends: repetitive physical effort, fast-paced work environments, and insufficient ergonomic prevention strategies.

Furthermore, the impact of these disorders extends beyond physical health. Numerous studies indicate strong associations between WMSDs, occupational stress, burnout, and reduced quality of life, underlining the complex nature of the challenges faced by nurses.

Table 1. Comparative analysis: Romania and other Eastern European countries

Country	Work schedule	Documented conditions	Social impact	Recommended measures
Romania	40h/week, max. 48h; frequent shifts	Moderate-to-high burnout (~75%), frequent lumbar pain	Fatigue, absenteeism, staff turnover	Multicomponent programs (exercise + ergonomics + psychological support)
Bulgaria	40h/week; long shifts in large hospitals	Frequent musculoskeletal complaints	Retention difficulties, intermittent absenteeism	Patient handling training, participatory ergonomics
Hungary	40h/week, up to 12h/day legally	High stress, sleep disturbances	Fatigue and risk of errors	Shift optimization, light exposure, micro-exercise interventions
Poland	8h/day, 40h/week average	Burnout in ICU and psychiatry	Reduced patient satisfaction	Multicomponent ergonomics, physical activity programs
Czechia/Slovakia	40h/week, ≤12h shifts	High burnout, comparable WMSD rates	Errors associated with fatigue	Sleep-friendly rotation, occupational health policies
Serbia	40h/week; extended shifts	High prevalence of lumbar pain	Impact on continuity of care	Transfer equipment, trunk/shoulder exercise programs

These considerations emphasize the urgent need for applied research aimed at documenting the prevalence and severity of WMSDs in Romania or in other countries (Table 1 Comparative analysis: Romania and other Eastern European countries) and supporting the development of interventions tailored to the local context. Addressing this gap is crucial not only for improving occupational health strategies but also for safeguarding the wellbeing and sustainability of a profession vital to healthcare delivery.

General objective

The general objective of this research is to analyze the impact of professional activity on the physical health of nurses by identifying and characterizing work-related musculoskeletal symptoms, their severity, and the contextual factors that may influence them. In a context where the prevalence of musculoskeletal disorders among healthcare personnel exceeds 75% worldwide (Sun et al., 2023), this study aims to provide data adapted to the Romanian hospital environment, contributing to international literature and supporting the development of ergonomic and organizational interventions. From this general aim, the following specific objectives are derived:

· Determining the prevalence of musculoskeletal discomfort among nurses – quantifying the proportion of medical staff experiencing discomfort in different body regions. Identifying the most affected areas (e.g., lumbar spine, cervical region, lower limbs) helps define priority intervention domains (Martin et al., 2025).

· Assessing the severity of reported symptoms – measuring symptom severity levels, from mild to severe. Pain intensity directly influences work capacity, professional quality of life, and absenteeism risk. Identifying severity categories not only confirms prevalence but also highlights the urgency of interventions (Jacquier-Bret & Gorce, 2025).

· Analyzing differences by sex and age – examining significant differences between sexes and age groups in symptom prevalence and severity. This analysis enables the design of personalized prevention programs (Yue et al., 2021).

· Identifying associated non-musculoskeletal symptoms – highlighting related manifestations such as mental fatigue, stress, headaches, or water retention. Although less prevalent, these symptoms reflect the complex interplay between physical and psychological health (Zhang et al., 2022).

· Correlating symptoms with occupational risk factors – exploring the relationship between symptoms and determinants such as prolonged static postures, long shifts, manual patient lifting, and lack of ergonomic equipment. This objective supports the identification of causal links and justifies organizational-level interventions (Özkan et al., 2023).

Developing these objectives contributes to a deeper understanding of the impact of work on nurses' physical health. They allow not only the quantification of the problem but also the formulation of practical recommendations tailored to the real needs of healthcare staff. By integrating musculoskeletal and psychological symptoms, the study proposes a holistic approach to occupational health (Table 2 Occupational Health Assessment Tools in Nurses), consistent with current trends in international research.

Table 2. Occupational Health Assessment Tools in Nurses

Acronym / Full Name	Evaluated field	Structure / Scoring	Use in medical personnel
PSQI – Pittsburgh Sleep Quality Index	Sleep quality (latency, duration, efficiency, diurnal dysfunctions)	19 items, overall score 0–21 (score >5 = poor sleep)	Evaluation of the effects of shifts on sleep; monitoring of interventions (napping, light, physical exercise)
FSS – Fatigue Severity Scale	Severity of fatigue and impact on daily functioning	9 items, Likert scale 1–7; mean score >4 = severe fatigue	Measurement of chronic fatigue in shift staff, ICU, UPU
MBI – Maslach Burnout Inventory	Level of burnout (emotional exhaustion, depersonalization, personal fulfillment)	22 items, three subscales; higher scores indicate increased level of burnout	Identifying the level of burnout in nurses and doctors
NMQ – Nordic Musculoskeletal Questionnaire	Prevalence and localization of musculoskeletal pain	Questions by anatomical regions, reporting symptoms in the last 12 months / 7 days	Monitoring the prevalence of WMSD (low back, neck, shoulder pain)
GHQ – General Health Questionnaire	General psychological health (anxiety, depression, stress)	12–28 items, overall score; higher scores indicate mental impairment	Screening for general mental health in an occupational context

MATERIAL AND METHODS

Study design

This research employed a descriptive observational design to evaluate the impact of professional activity on the physical health of nurses, allowing prevalence and severity to be analyzed in a naturalistic setting without external interventions (Polit & Beck, 2021). The observational study was conducted on a sample of 12 active nurses from various wards. It included questions about affected areas, symptom types, their frequency, and impact on professional activity. The study is descriptive and transparent with respect to data collection and reporting.

Population and sample

Participants were active nurses employed in public and private hospitals. Inclusion criteria were age 22–60 years, at least one year of professional activity, and absence of severe neurological diagnoses. A convenience sample of 12 respondents was recruited (70% women; 30% men), reflecting the typical gender structure of the profession in Romania (Eurofound, 2022).

Instruments and variables

Data were collected via a structured questionnaire adapted from the Nordic Musculoskeletal Questionnaire (Kuorinka et al., 1987). Sections included: demographics (age, sex, tenure), affected body regions, symptom intensity (Likert 1–5), and associated symptoms (fatigue, stress, headaches). Content validity was verified by two occupational health experts.

Data collection procedure

Questionnaires were distributed electronically; completion was voluntary and anonymous. Participants provided informed consent after being briefed on objectives. The response rate was 92% (Creswell & Creswell, 2021).

Statistical analysis

Data were processed using descriptive statistics (percentages and means). Results are presented in tables and figures.

Ethical considerations

The study complied with the Declaration of Helsinki (2013). Informed consent was obtained; data were anonymized; and no conflicts of interest were declared.

a. A day's work the sensations that the research subjects feel after a day of work “0. I don’t feel any discomfort; 1. Mild sensations of discomfort; 2. Moderate sensations of discomfort; 3. Severe sensations of discomfort; 4. Discomfort and pain for which I take medication; 5. I feel like I’m going crazy from the pain;” (Figure 1).

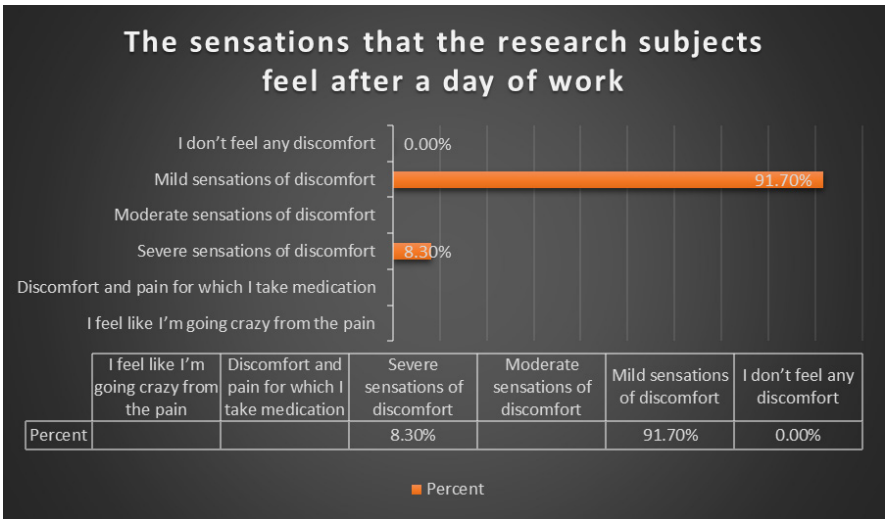

Fig. 1. The sensations that the research subjects feel after a day of work

b. Head-neck – cervical area the sensations that the research subjects feel after a day's work in the cervical area "0. I don't feel any discomfort; 1. Mild sensations of discomfort; 2. Moderate sensations of discomfort; 3. Severe sensations of discomfort; 4. Discomfort and pain for which I take medication; 5. I feel like I'm going crazy from the pain;" (Figure 2)

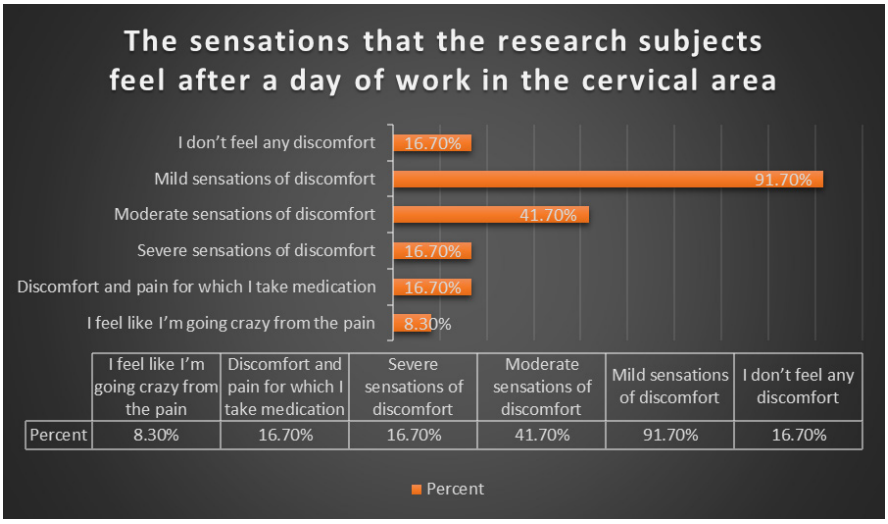

Fig. 2. The sensations that the research subjects feel after a day's work in the cervical area

c. Torso, spine, thoracic and lumbar area, the sensations that the research subjects feel after a day of work in the thoracic and lumbar area "0. I don't feel any discomfort; 1. Mild sensations of discomfort; 2. Moderate sensations of discomfort; 3. Severe sensations of discomfort; 4. Discomfort and pain for which I take medication; 5. I feel like I'm going crazy from the pain;" (Figure 3)

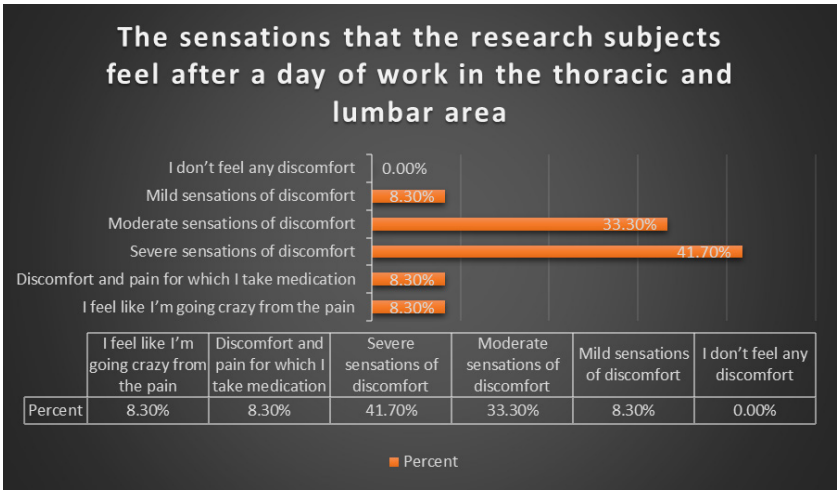

Fig. 3. The sensations that the research subjects feel after a day of work in the thoracic and lumbar area

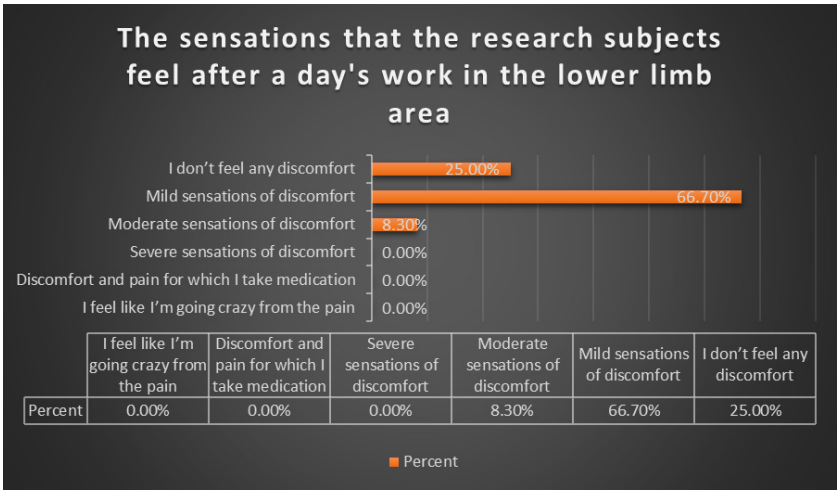

Fig. 4. Sensations that research subjects experience after a day's work in the lower limb area

d. Upper body, shoulders, elbows, wrists, sensations that research subjects experience after a day's work in the lower limb area "0. I don't feel any discomfort; 1. Mild sensations of discomfort; 2. Moderate sensations of discomfort; 3. Severe sensations of discomfort; 4. Discomfort and pain for which I take medication; 5. I feel like I'm going crazy from the pain;" (Figure 4)

e. Pelvis, coxofemoral joint, hips, the sensations that the research subjects feel after a day of work in the area of the coxo-femoral joint, "0. I don't feel any discomfort; 1. Mild sensations of discomfort; 2. Moderate sensations of discomfort; 3. Severe sensations of discomfort; 4. Discomfort and pain for which I take medication; 5. I feel like I'm going crazy from the pain;" (Figure 5)

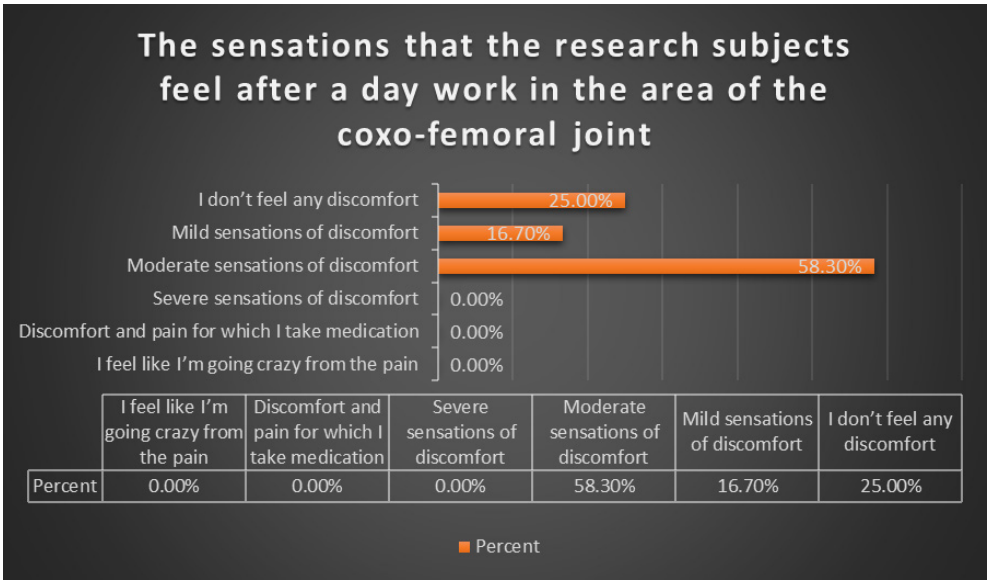

Fig. 5. The sensations that the research subjects feel after a day of work in the area of the coxo-femoral joint

f. Lower body, knee joints, ankles, soles the sensations that the research subjects feel after a day of work in the area of the knees, ankles and soles" 0. I don't feel any discomfort; 1. Mild sensations of discomfort; 2. Moderate sensations of discomfort; 3. Severe sensations of discomfort; 4. Discomfort and pain for which I take medication; 5. I feel like I'm going crazy from the pain;" (Figure 6)

Fig. 6. The sensations that the research subjects feel after a day of work in the area of the knees, ankles and soles

g. Other sensation of discomfort the sensations that the research subjects feel after a day's work at the level of the lower limbs "0. I am not aware of having any venous disorders and experience no discomfort; 1. I have varicose veins associated with mild sensations of discomfort; 2. I have varicose veins associated with moderate sensations of discomfort; 3. I have varicose veins associated with severe sensations of discomfort; 4. I have varicose veins accompanied by discomfort and pain requiring medication; 5. I have varicose veins and experience pain of such intensity that it feels unbearable;" (Figure 7)

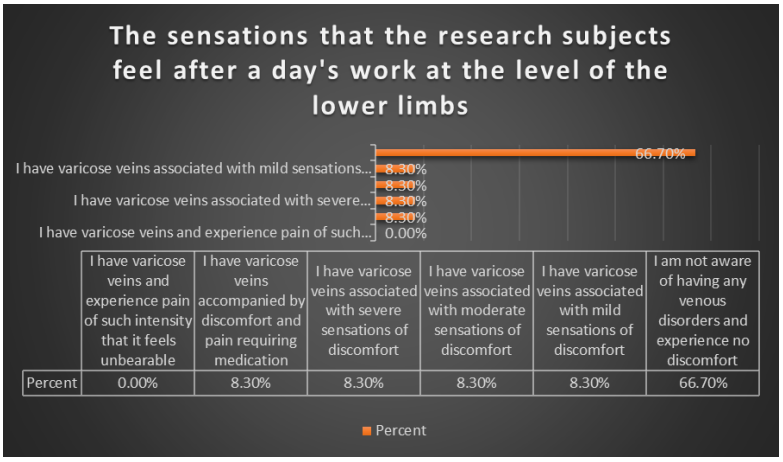

Fig. 7. The sensations that the research subjects feel after a day's work at the level of the lower limbs

Data analysis

The data were statistically processed by frequencies and percentages (Table 3 Distribution of musculoskeletal symptoms), and the results were presented in comparative tables and graphs.

Table 3. Distribution of musculoskeletal symptoms

Symptom / Affected area	Prevalence (%)	Reported level	Further comments
General discomfort (body segment)	91.7	—	Very high prevalence
Cervical area	83.3	Moderate – extreme	Tension, muscle pain
Backbone	58.3	Major – Extreme	Stiffness, chronic pain
Lower limbs	64.3	Medium – extreme	Cramps, fatigue
Water retention	8.3	Mild – moderate	Associated symptom
Headaches	8.3	Mild – moderate	Associated symptom
Mental fatigue	8.3	Mild – moderate	Stress-related
Stress	8.3	Mild – moderate	Correlated with mental fatigue

RESULTS

The study revealed a high prevalence of musculoskeletal symptoms among the participating nurses. Overall, 91.7% reported discomfort in one or more body segments. The most affected regions were the cervical area (83.3%), spinal column (58.3%), and lower limbs (64.3%). Additional symptoms—water retention, headaches, psychological fatigue, and stress—were each reported by 8.3% of participants. Comparative analyses indicated that women more frequently reported lumbar and cervical pain, whereas men more often reported pain in the upper and lower limbs (Table 4 Comparing symptoms by gender). Differences were statistically significant for the cervical region ($p < .05$). Age-stratified analyses suggested lower chronic pain incidence among younger staff (22–35 years), with symptom intensity increasing with age and years of service.

Table 4. Comparing symptoms by gender

Affected area	Women (%)	Men (%)
Lumbar region	50	35
Cervical region	35	20
Lower limbs	10	20
Upper limbs	5	15

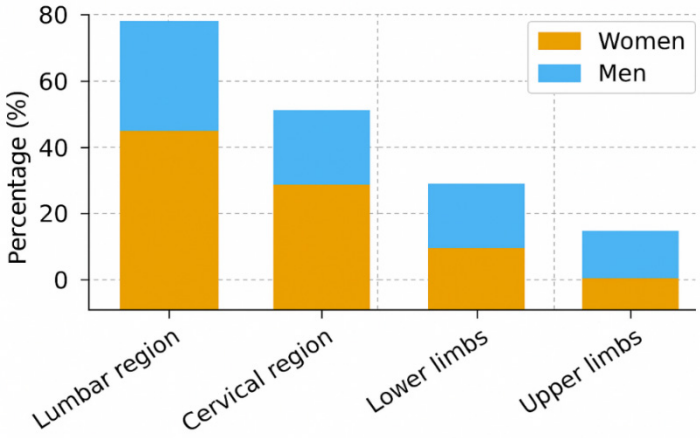

Fig. 8. Different for each important body region

The conceptual model (Figure 8) highlights the causal chain between risk factors, symptoms and consequences on professional performance. The limitations of the study include the small number of participants and its local nature, which limits the generalization of the conclusions.

Analysis highlighting gender differences in the occupational health of nurses

Studies reveal specific patterns in the prevalence of musculoskeletal disorders, burnout, sleep disturbances, and social impact, which justify differentiated measures of prevention and support. (Figure 9).

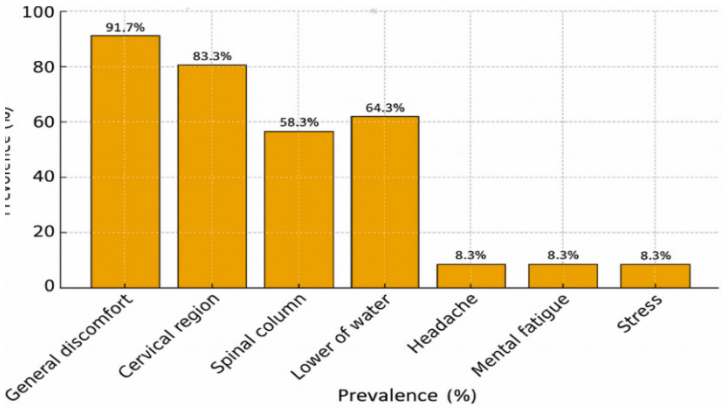

Fig. 9. Prevalence of symptoms

In order to gain a clearer understanding of the causal mechanisms, we present below a conceptual model of the interaction of risk factors, symptomatic manifestations and their effects. “Incorrect physical exertion à risk factors à static postures à lifting patients à low back pain à neck pain, limb pain, decreased performance” (Figure 10).

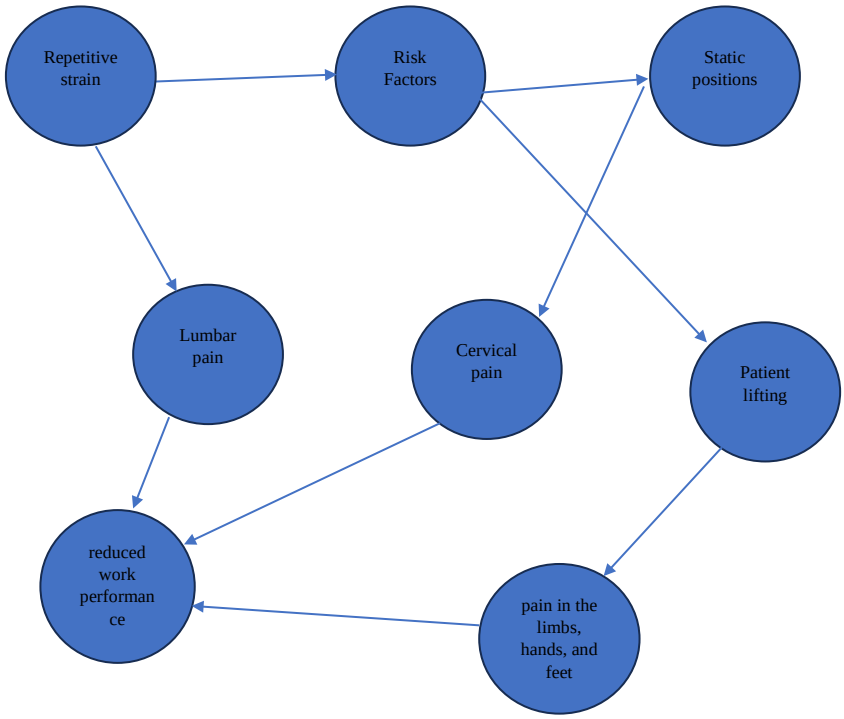

Fig. 10. The link between risk factors, symptoms and consequences

DISCUSSIONS

The results obtained confirm the high prevalence of musculoskeletal disorders among nurses, in accordance with the international literature. Recent meta-analyses report an overall prevalence of 77–80% (Sun et al., 2023; Martin et al., 2025), and the data from this study indicate even higher values (91.7%), suggesting that Romanian nurses are at significant risk. The differences observed between sexes and age groups are similar to the results of other research (Yue

et al., 2021), suggesting that physiological factors and characteristics of occupational tasks influence the distribution of symptoms (Table 5 Current practices versus proposed recommendations for the prevention of musculoskeletal pain).

An important aspect is the associated symptoms, such as stress and mental fatigue. They reflect the link between physical and mental health, confirmed by recent studies that have highlighted correlations between chronic pain and burnout in healthcare professionals (Zhang et al., 2022). Thus, the prevention of musculoskeletal disorders must be integrated into a holistic strategy, which includes both ergonomic measures and psychological support. Likely causes include prolonged postures, lifting patients, lack of breaks, and physical overload. The results confirm the prevalence of low back and neck pain in nurses, in accordance with the international literature (Trinkoff et al., 2007). The comparative analysis shows that women report lower back and neck pain more frequently, while men report limb pain more frequently. These differences can be explained by the distribution of tasks in the workplace and physiological differences. The reported psychiatric symptoms indicate the existence of an interdependence between occupational stress and somatic manifestations (Caruso, 2018).

Table 5. Current practices versus proposed recommendations for the prevention of musculoskeletal pain

Current practices	Proposed recommendations
Manual patient pick-up	Use of mechanical equipment and ergonomic techniques
Rare breaks during shifts	Introducing stretching breaks and short exercises, even “gym class” in the hospital's fitness room
Lack of periodic training	Regulars trainigs of SSM
Focus on productivity	Focus on employee health and prevention
Specific seminars (rarely)	Increase the number of specialized seminars that include practical applications*

CONCLUSIONS

The study showed a very high prevalence of musculoskeletal symptoms among nurses, especially in the cervical area, spine and lower limbs. These results confirm the importance of implementing prevention programs and adapted organizational policies.

General recommendations include:

- introduction of periodic ergonomics training;
- the use of mechanical equipment for lifting patients;
- organizing active breaks with stretching exercises;

· occupational health monitoring programs;

· integration of psychological support services to reduce stress and mental fatigue.

Future research directions should include longitudinal, multicenter studies and evaluations of the effectiveness of ergonomic interventions in reducing the prevalence of musculoskeletal disorders in healthcare professionals. The professional activity of nurses has a major impact on physical health, especially on the lumbar and cervical regions. The results underline the importance of implementing OSH and prevention programmes. Recommendations include appropriate equipment, safety and security training, regular breaks, and organizational support programs. The vast majority of nurses suffer from daily physical discomfort. The most affected areas are the neck and spine. It is necessary to implement prevention programs, even gyms inside hospitals where nurses can take active breaks under the supervision of the coach specialized in compensatory and relaxation physical exercises, seminars with appropriate topics by inviting specialists in the field of sports and with topics related to body posture and ergonomic-functional movements, and also psychological support where appropriate. Future studies with larger samples are essential to understand the extent of the problem.

Longitudinal and multicenter studies are needed to investigate the impact of ergonomic interventions on the musculoskeletal health of nurses. Future research should also include the correlation between physical health and phenomena such as occupational stress and burnout.

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