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Physical Health Threats among Nurses and Existing Preventative Measures.

Metropolia University of Applied Sciences

Degree Programme in Health Care and Nursing SXN23S1B/SXN23S1B1

Bachelor's Thesis

August 2024

Abstract

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Title: Physical Health Threats among Nurses and Existing Preventative Measures

Number of Pages: pages + appendices

Date: August 2024

Degree: Bachelor of Health Care

Degree Programme: Nursing and Health Care

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Hazardous physical conditions include needlestick injuries, infectious diseases, chemicals and violence at workplace among which nurses are at risk. These risks are not a thing of the past today; they are still evident making questions asked on the efficiency of the preventative measures instituted across the globe.

The purpose of the study was to describe the physical health threats nurses encountered in their work and the existing preventative measures.

A descriptive literature review was conducted and only the literature that has been published in the last ten years was included. The research evidence also shows that MSDs are a highly concerned factor because of repetitive task activity and patient handling. Needlestick injuries occur frequently, particularly in user areas such as emergency departments, where protective measures are insufficient. Pathogenic agents as well as exposure to chemical risks remains a giant threat as the use of protective devices is still irregular. Patient-related violence is also well underscored and has highlighted idealism in emergency areas.

The research findings show that the current precautionary measures are inadequate, thus the requirement of robust and comprehensive safety measures, training, and good ergonomics at work to safeguard the nurses and improve the quality of service provision to the patients.

Keywords: Physical health threats, Nurses, Occupational Hazards

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Contents

1 Introduction

The challenges of the nursing profession which many consider to be demanding put nurses at high risk of developing several physical health concerns in almost every unit of the hospital. Nurses are professionals who play a crucial role in the healthcare system and are tasked with delivering nursing care to the patients. However, their functions expose them to work hazards that can jeopardize their health and efficiency in the working place. These physical health hazards include musculoskeletal disorders, patient handling accidents, needlestick injuries, infectious diseases, chemical hazards, and workplace violence. These hazards affect the health of nurses and also their efficiency (Rasool, Wang and Zhang, 2022: 405-420; Shah, Alotaibi, and Al-Dossary, 2021: 219-227).

Occupational hazards are not rare and are encountered rather frequently. For instance, a study asserted that musculoskeletal disorders constitute a major ailment affecting the nurses because many of their tasks involve repetition and physical strain (Rasool et al., 2022: 405-420). Likewise, another study also emphasized the widespread occurrence of needlestick injuries and the resulting health risks from infectious diseases (Shah et al., 2021: 219-227). Collectively, these kinds of studies raise the imperative for multifaceted plans to address such hazards and safeguard nurses' wellness.

Besides that, the effects on the psychological wellbeing of the nurses exposed to workplace violence has been a worry as well. Workplace violence causes a health-related issue among the working nurses due to enhanced stress and subsequent burn out (Spector, Zhou, and Che, 2014: 72-84). Escalating literature points to the need for enhanced preventive measures and help seeking mechanisms to support nurses who receive such threats (Pich, Kable, and Hazelton, 2022: 123-138).

In summary, the overall purpose of the study is to describe the physical health threats nurses encounter in their work and the existing preventative measures. The aim of this study is to produce knowledge that can be utilized by shedding light on the various physical health threats encountered by acute care nurses and to enhance awareness for the development of effective preventive measures.

2 Background

Nursing can be described as an occupation that requires physical and psychological endurance, nurses practice in surroundings that present numerous risk factors in their working places (Nerek, Wesołowska-Górniak, and Czarkowska-Pączek 2021: 256-260; Joshua and Karkada, 2017). These hazards affect nurses in different parts of the hospital, different specialties and constitute health risks to the physical well-being. Identifying these risks is an important and pressing necessity in the view of providing proper protection of nurses' health and offering excellent patient care. This section provides a literature review in relation to the primary conceptual areas as well as prior studies as part of the background knowledge: physical health risks, occupational hazards, and protection for the nurses. (Nerek, Wesołowska-Górniak, and Czarkowska-Pączek 2021: 256-260.)

This study is based on the Social Cognitive Theory (SCT), which suggests that people's thoughts, experiences, and interactions with others all play a role in shaping their behavior (Bandura, 2014: 248-287). SCT is applicable in the nursing profession as it reveals how nurses understand and deal with risk factors at the workplace. Consequently, based on SCT, the lifestyles led by these nurses in terms of protective or ergonomic measures would be determined by their self-efficacy, outcome expectations, as well as the social support from the environment in which they work (Ramos, Cerdeira, and Oliveira, 2018: 50-58). It is against this background, therefore, that the present study investigated cognitive and environmental factors that may pose a threat to the physical health of nurses with a view of identifying solutions to the problem.

Studies have shown that the observed level of risk towards physical health among nurses is significantly high; this includes MSDs, exposure to HIV/AIDS, tuberculosis, and other infectious diseases, and needlestick injuries. In a cross-sectional study it was found that 64% of the nurses suffered from MSDs mainly due to repetitive activities, patient handling, and prolonged standing. These results imply the importance that has to be given to ergonomic practices in the workplace to reduce the cases of MSDs. (Zhang, Zhuang, and Huan, 2021.)

Despite this, needlestick injuries are a recurrent issue in nursing putting patients and health care workers at risky of infections like hepatitis and HIV. Authors have conducted a study and have found that a large number of nurses, especially in emergency, and surgical departments, are likely to sustain needlestick injuries due to heightened

work intensity and variability. The study also recommended the development of comprehensive educational courses to increase nurses' sensitivity and compliance with safety measures. (Zhang and Zhang, 2019.)

Most occupational risks in nursing go beyond mechanical injuries to other risks such as: chemical risks, psychological risks, and risks posed by violence at the workplace. Physical hazards with regards to chemical exposure to hazardous drugs and disinfectants undermine the health of nurses. The effects include: respiratory disorders and skin irritations (Xu, Zhu, and Wang, 2020: 50-58). Still, compliance with safety measures that may help to prevent risks, for example, wearing specific clothes and providing natural or forced fresh air, varies among healthcare facilities.

Another type of aggression that has been mentioned is workplace violence that includes both physical and verbal violence threatening the life of a nurse. A study engaged a cross-sectional descriptive survey to reveal that patient-sourced workplace violence is rife and stresses nurses and decreases job satisfaction. The importance of organizational policies that safeguard nurses against exposure to violence and laid down ways of addressing the issue for nurses who were victims of violence. (Magnavita, 2014: 175-182.)

There is ample research on the physical health hazards to which nurses are exposed, however, there are still some research voids that need to be filled: specifically, the distribution of hazards by unit and specialty. For instance, the studies done on nurses' exposure to the risks have primarily focused on acute care settings, even though other settings like long-term care, pediatric, and psychiatric units exist. Also, the analysis of risk factors for physical and psychological health in nursing has not been investigated, including the fact that stress and burnout can worsen physical health (Mousavi, Rostami, and Shadnoosh, 2022: 140-155).

This study will help fill these gaps by presenting a detailed overview of the physical health risks of nurses in different units and assessing the efficacy of the current risk reduction strategies.

In summary, the purpose of the study is to describe the physical health threats nurses encounter in their work and the existing preventative measures. The aim of this study is to produce knowledge that can be utilized by shedding light on the vari-ous physical

health threats encountered by acute care nurses and to enhance aware-ness for the development of effective preventive measures.

3 Purpose, Aim and Research Questions

The purpose of the study was to describe the physical health threats nurses encountered in their work and the existing preventative measures.

The aim was to produce knowledge that could be utilized by shedding light on the various physical health threats encountered by nurses and to enhance awareness for the development of effective preventive measures..

Research questions:

1) What were the physical health threats experienced by nurses in their daily work environment?
2) What were the current preventive measures to decrease the risk of physical hazards to nurses?

4 Methodology

4.1 Data Collection Method

A descriptive literature review summarized the body of research that had already been done on a specific topic. A descriptive literature review is a common tool in nursing used to identify gaps, patterns, and trends in the body of knowledge already available on a particular topic. The process involved combining and simplifying the results of multiple studies to offer a comprehensive overview of the state of knowledge as it was. When the goal is to summarize the present state of research on a topic, propose topics for further investigation, and inform practice or policy decisions, this kind of literature review is particularly relevant. (Saltikov and Mcsherry, 2016;11-15.)

4.2 Data Search and Selection

A systematic review of relevant literature was conducted as part of the data search and study selection process, with an emphasis on research on health problems and occupational hazards for nurses. The methodology for data collection involved doing a me-

thodical search of databases, MedLine and CINAHL, with a particular emphasis on research concerning health problems and hazards faced by nurses in working environments. Articles written in English, published within the last ten years, and particularly addressing physical health concerns in nursing were the publications that were included in the search. The methodological approach to this qualitative study was a descriptive literature review, with PRISMA criteria used to explain the data collection process. Data was gathered using the following keywords: "Physical Hazards," "Physical Health Threats," “Physical injuries” and "Nurses."

Table 1 demonstrates that, the inclusion criteria guide the selection of relevant material, while the exclusion criteria help filter out irrelevant or less suitable content for the research.

Table 1 : Inclusion and Exclusion criteria

Inclusion criteria	**Exclusion criteria**
Primary studies and peer- reviewed articles	Other literature reviews
Articles written in English	Articles in other languages
Studies specifically addressing physical health risks in nursing	Studies addressing mental health risks and problems in nursing
Studies published within the last 10 years (2014-2024)	Studies published before 2014.

Table 2 assists in planning research searches related to physical health threats among nurses within the context of a healthcare setting. The three key components—Population (P), Interest (I), and Context (Co)—guide the search process for relevant information.

Table 2: PiCo-Tool for planning the search strategy

Population (P)	Nurses
Interest (I)	Physical Health Threats

Context (Co)	Healthcare setting

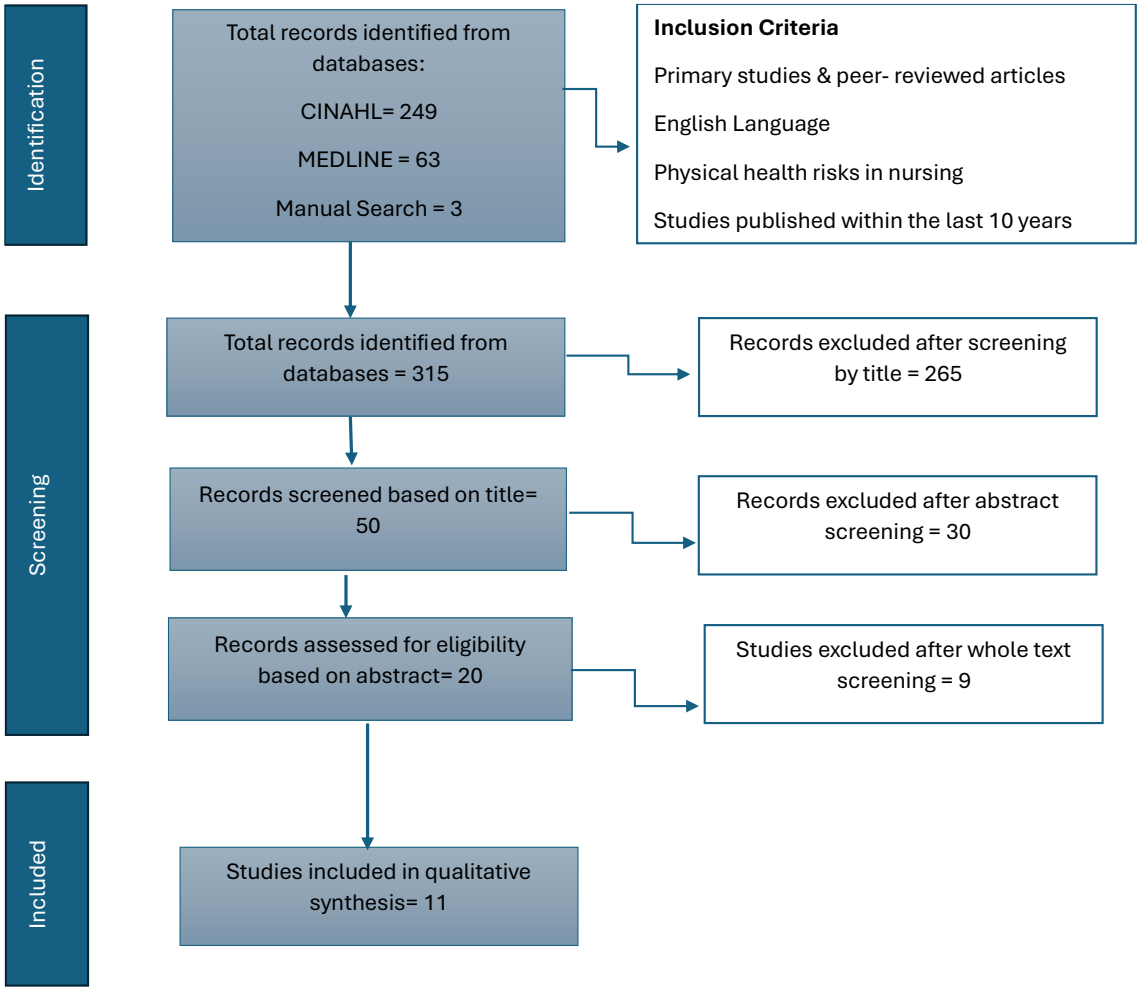
Table 3 summarizes the search strategy for a literature review on physical health risks among nurses in hospital settings. Two databases, CINAHL and MEDLINE, were used. The search terms included variations of “nursing,” “physical health,” and “hospital setting.” Limiters such as English language, peer-reviewed articles, and the publication period from 2014 to 2024 were applied. The initial hits were 249 for CINAHL and 63 for MEDLINE. Articles were progressively selected based on title, abstract, and finally, the entire text, following the inclusion and exclusion criteria.

Table 3 : Results of Database Searches

Database	**Search Terms**	**Limiters**	**No. of Hits**	**Selected based on title**	**Selected based on abstract**	**Selected based on whole text**
CINAHL	(nurs or nurses or nursing) AND (physical health or physical wellbeing or physical illness or physical health problems) AND hospital setting	English Peer-reviewed, Research Article, Evidence-Based Practice 2014-2024 Journal-Nursing	n=249	n= 41	n=15	n=7
MEDLINE	(nurses or nursing staff or nurse) AND (physical health or physical wellbeing or physical illness or physical health problems) AND hospital setting	Peer Reviewed 2014-2024 English Language Journal Articles	n= 63	n=9	n=5	n=1
Manual Search						n=3

			Total= 312	**Total= 50**	**Total= 20**	**Total= 11**

Figure 1: PRISMA chart



4.3 Data Analysis Method

A qualitative research method called inductive analysis involves deriving conclusions, themes, or theories directly from the data itself without using any of prior ideas or assumptions. When used in qualitative research, the inductive analysis approach highlights how crucial it is to let themes and patterns naturally arise from the data. During the first phases of inductive analysis, researchers fully immerse themselves in the information

gathered by techniques including observations, interviews, and documents. Before beginning the analysis, researchers can use this data immersion approach to become well-versed in the content and develop a thorough comprehension of the data (Topping, Gerrish, Lacey, and Cormack, 2010: 129–139.)

One of the core principles of inductive analysis is the idea of open coding. Open coding involves dividing the data into smaller portions and giving each splitting a code or descriptive title. Researchers can find concepts, themes, and patterns in the data by using open coding, which allows them to do so without imposing predefined frameworks or categories (Topping, et al, 2010: 129–139.) Moreover, the academic structure of inductive analysis, in which open coding is followed by axial coding by researchers. Creating links between various codes, putting them into more general categories or themes, and arranging the information in a more orderly way are all part of axial coding. Researchers can find links and relationships in the data by using this approach (Topping, et al, 2010: 129–139.)

Researchers may use selective coding as the study goes on to refine the themes that have been found and create a coherent narrative that describes how the themes relate to one another. Choosing the fundamental themes that best capture the data and creating an in-depth understanding of the phenomenon being studied are the tasks involved in this stage of inductive analysis. Constant comparison is the technique by which researchers match newly collected data with previously coded data throughout the inductive analytic process. This repeated process improves the analysis and increases the reliability of the results by ensuring coherence and consistency in the emerging themes (Topping, et al, 2010: 129–139.)

All things considered, inductive analysis in qualitative research is an organized and precise procedure that enables researchers to produce new information, hypotheses, and insights straight from the data. Researchers can get rich and nuanced understandings of complicated events and make significant contributions to the field of study by adhering to the principles of inductive analysis (Topping, et al, 2010: 129–139.)

Based on the methodology used in this study, the data was analyzed qualitatively through an inductive analysis method in which the themes and conclusions made were derived directly from the data by the researchers without influence from prior hypotheses. The approach that was followed at the initial stage involved data immersion whereby the researchers have to get into a more detailed interaction with the information that was

collected from the selected articles. Subsequently, the process of open coding was used to divide the collected data in parts, each of which received a code. This made it possible to determine specific concepts and patterns that are relevant to the threat and prevention of physical health risks among nurses. The next type of coding was axial coding in which these codes were connected to form categories and themes that would assist in the organisation of data. Last, but not least, selective coding enriched the main codes, and elaborated the thematic analysis to make it more consistent and represent the outcome of the study. In the course of the analysis, constant comparison was made to make sure that the research themes were consistent and reliable in the generation of new knowledge on nursing health and safety.

5 Results

The overall data search returned 312 articles of interest of which 50 were accepted based on the title, 20 based on the abstract, and 11 after reading the abstract completely. The following 11 articles were then narrowed down in order to identify topics focusing on physical health risks and protective steps for nurses.

5.1.1 Physical Health Threats Among Nurses.

The threats are summarized below and were all established to be components of the physical health risks that nurses encounter in their workplace.

Musculoskeletal Disorders (MSDs)

Based on this statistics fi ndings, it was established that nurses were highly affected by Musculoskeletal disorders (MSDs). This condition develops mainly from repeated movements, frequently lifting and transferring patients' weights, long standing and uncomfortable postures. Nurses are predisposed to lumbar region back pain, whereby age, work experience, and BMI in particular influence these disorders (Szajerska, Grzelak, and Szostak, 2020).

Needlestick and Sharps Injuries

Needlestick and sharps injuries are examples of physical health risks that fall among the characteristic features of a nurse's working environment; particularly those working in areas with increased exposure such as in the emergency departments. Operating

room nurses' illumination-associated injuries' prevalence in Thailand (Chiannilkul-chai, and Ke-jkornkaew, 2019). Likewise, the kind of injuries is common during night shift since the safety measures are missing or crudely implemented (Santos, Macedo, Silva, Resck, Nogueira, and Terra, 2017).

Infectious Diseases

Nurses are considered being at a higher risk group because of close contact with the patients and the possibility of contacting potentially infected biological specimens. In 2014, it was reported that 52% of the nurses studied encountere threats to their physical health as a result of occupational accidents concerning potentially contaminated biological materials (Valim, Marziale, Hayashida, and Richart-Martínez, 2014). Inadequate contact with pathogens as a major danger (Chen, Lai, Chiou, Huang, and Chien, 2023) .

Chemical Hazards

Another physical health risk that nursing students are exposed to is the dangerous chemicals which are used in cleaning and disinfection of surfaces, equipment's and even hands. This is evident from the number of cases that reveal lack of hospital policies on the use of ampoule openers, which are limited in use hence increasing the risk of sharps injuries to the health practitioners. The insufficient use of safety devices is one of the key problems (Chiannilkul-chai, and Kejkornkaew, 2019).

Patient-Related Violence

The following areas identified concerning patient-related violence: Intoxication with alcohol, using substances or having mental illness, was reported to be often by the nurses. In a cross-sectional survey it was determined that violence was associated with nurse and patient variables as well as with the emergency department (Pich, Kable and Hazelton, 2017).

5.1.2 Preventive Measures

The current preventive measures that the study pointed out include the following The research also established that there are several existing preventive measures in place in an attempt to reduce physical health danger in the Nurses.

Ergonomic Interventions

Preventive measures in nursing include mechanical lifts and transfer devices that help in the prevention of musculoskeletal disorders among the employees. Lack of proper training is another threat; it was recommended that general training programs should be enhanced on the correct body mechanics and lifting (Szajerska et al.,2020). In their 2021 article, the authors argued that physical structures of nursing facilities and patients equipments should be improved by enhancing their mobility to allow easy transportation of the patients (Aly, El-Shanawany, and Ghanem, 2021).

Needlestick Prevention Programs

For needlestick and sharps injuries proper protective devices and periodic institutional procedure training for their safe use and disposal. Training on preventing sharp needlestick injuries and emphasizing the significance of reporting systems is essential in reducing and addressing these incidents effectively.(Chiannilkulchai and Kejkornkae, 2019). Similarly, it was acknowledged that the necessity of which the departments should obtain visible training and the proper precautions (Abebe, Kassaw, and Shewangashaw, 2018).

Infection Control Protocols

It is established that numerous precaution measures such as wearing PPE and vaccinating the workers against various infections are important in reducing the risks of the diseases. Two studies, suggested that the display of standard precautions do affects the lowering of infection risks conclusively (Chen et al., 2023; Valim et al. 2014).

Chemical Safety Protocols

All chemicals must be properly labeled, stored, and disposed correctly along with relevant health and safety training and guidelines concerning the handling of potentially hazardous substances should be conducted. The policies that should be extended in the hospital include the use of an ampoule opener to minimize threats of sharps injuries (Chiannilkulchai and Kejkornkaew, 2019).

Work Environment Improvements

Improving organizational environment, containing ergonomics hazards, encouraging health, and cultivating collaboration can potentially decrease adverse effects of work for nurses. It is important to create a healthy work environment with the right tools (Cattani et al., 2022).

6 Discussion

The conclusions of this examine solidify the perception discerned in the background that nursing is a occupied profession that poses danger to physical health. The results of the study have been elaborated with reference to the earlier studies that have demonstrated a high incidence of MSDs among the nurses due to nature of the nursing jobs and tasks that involve lifting, pulling, twisting, bending and standing for long hours. For example, the background cited that 64% of nurses have MSDs that affect, especially the lumbar part, because of these repetitive activities (Zhang, Zhuang, and Huan, 2021). This study establishes that MSDs are still relevant, especially for nurses whereby they contribute to health risks by age, work experience, and BMI (Szajerska, Grzelak, and Szostak, 2020). These findings are in concordance with the previous research that provides urgency to the need for ergonomic interventions and changes in the workplace to prevent such risks.

In the same way, the results obtained in the study regarding needlestick and sharps injuries support the background issues. The background discussed such injuries as being common, especially in the departments with the highest level of exposure such as emergency and surgical departments, and presented the potential health consequences pointing at the risk of spreading of infectious diseases (Shah, Alotaibi, and Al-Dossary, 2021). The findings of the present study support the fact that such injuries are frequent and worsened by poor precaution during night shifts (Chiannilkul-chai and Kejkornkaew, 2019; Santos et al. , 2017). This discovery emphasizes the importance of the training courses related to needle safety as well as finding the existing safety measures to be weak in terms of their realization, especially in conditions of high-stake stress.

This is also evident in infectious diseases, which are also a major risk as pointed in both the background and the findings. The background provided references to work, which indicated that a high proportion of nurses had high possibility of contracting infection through contact with patients and contact with infected objects (Valim et al. ,

2014; Chen et al. , 2023). This study also brings into focus the inability to Provide protection as to the lack of preventive measures against these occupational exposure to infectious disease by establishing that even more nurses are at risk from occupational accidents with PPCM. This result implies that despite adopting standard precaution the implementation of the measures is irregular, it is therefore important to rethink and invigorate the infection prevention techniques to safeguard the HCWs.

Chemical hazards were also identified as another essential factor, in line with the background where exposure to hazardous drugs and disinfectants was highlighted as a potential risk factor (Xu, Zhu, and Wang, 2020). The level of use safety devices such as ampoule openers was identified as small and high risks of chemical exposure and sharps injuries were noted (Chiannilkul-chai and Kejkornkaew, 2019). This discovery points to the fact that chemical safety measures should be enhanced and the deployment of safety gadgets and gears promoted to tackle these risks.

However, the subject of patient-associated violence was emphasized both in the background and in the findings of the study. The background highlighted the effect of the workplace violence on nurses' well-being emphasizing the importance of the measures to prevent violence risks (Magnavita, 2014; Pich, Kable, and Hazelton, 2017). In applying the principles of this research, it was determined that patient-related violence is still rife especially to nurses treating patients under the influence or suffering from mental illness. The fact that violence in emergency department settings remains common as depicted in the study calls for special measures and devices to safeguard nurses against the potential repercussions of any physical confrontation.

On this basis, the study offers new knowledge about the interaction patterns of the factors determining the distribution and occurrence of physical health risks between separate nursing units and specialties. Although the background informed the level of risk, this research offers knowledge of reasons why some risks are more probable in individual cases because of work experience and unit specialization. Additionally, the study reveals lacunas in the current approach pointing to the fact that while some preventive measures are provided including ergonomic adjustment of tools and needle safety training they are not comprehensive, nor well implemented or effective. This post indicates that there is a call for better and all-rounded models to deal with the nursing hazards that are not only physical but also psychological.

Finally, it is necessary to stress that results obtained in this study once again prove hazardous physical health risks the nurses are exposed to and insufficiency of existing

protective measures. These studies raise questions about the ways to protect the nurse safety that should encompass such measures as improvement of the training programs, the strengthening of the compliance with the safety standards, the changes to the working conditions. Hence, healthcare institutions shall be in a position to safeguard and enhance the lives of their nurse employees while at the same time enhancing the quality of care that is offered to patients.

7 Conclusion

This study gives credence to other associated physical health hazards that endanger the lives of nurses, thereby stressing the need to put in place efficient preventive measures. The key assumptions of this study echo with previous studies, affirming that the principal nursing health crunches comprise musculoskeletal disorders, needlestick injuries, infectious diseases, chemical risks, and patient aggression. The results reveal an urgent necessity for integrated policies, recurrent training initiatives, and proper funding to prevent these threats.

The implications of these findings are broader than the context of this paper, stressing the urgent need for healthcare organizations to pay attention to the health statuses and well-being of the nursing workforce. With filling the aforementioned gaps in the prevention measures, various healthcare organizations can promote safer organizational environments, which would in turn improve the quality of the care of patients treated in these organizations.

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Appendices

Appendix 1 : Summary of Selected Articles

Author (s), year, country	Topic/Title	Methodology and Methods	Participants	Main Outcomes
Abd El-Fattah N., Aly M., El-Shanawany S. M., Ghanem M., 2021, Egypt	Nursing workplace and its relation to occupational health outcomes and physical activity	The methodology involved a cross-sectional correlation study with 623 nurses, data collection through self-administered questionnaires, inclusion of nurses with at least one year of experience, and evaluation of questionnaires for validity and reliability.	623 nurses Nurses with at least one year of experience, exclusion of nurses with spinal pathological conditions	The study emphasized the importance of understanding the workplace context for healthcare safety, highlighted low levels of physical activity among nurses, and identified workplace conditions as key factors affecting physical activity and occupational health outcomes.
Abebe, A. M., Kassaw, W.,	Prevalence of needle-stickand sharp object injuries and its associated factors	The methodology used in the study included an institutional-based cross-sectional design, self-administered structured questionnaires,	Population characteristics: The study population consisted of 151 staff nurses in Dessie referral hospital, Amhara region, Ethiopia, with	The study found a high prevalence of needlestickand sharp object injuries among staff nurses in Dessie referral hospital, with 43% experiencing such injuries.

She-wangashaw, N. E., 2018, Ethiopia	among staff nurses in Dessie referral hospital Amhara region, Ethiopia, 2018	one-day training for data collectors and supervisors, data checking for completeness and consistency, data entry and analysis using statistical software, bivariate analysis for variable selection, and presentation of findings through frequency, tables, and graphs.	65% males. 32% were from the emergency department, and majority (69.0%) were dissatisfied with their job. 59% reported the absence of a post-exposure management facility, and 42.6% didn't know where to report needle-stickand sharp object injuries.	Nurses working in the emergency department were significantly more likely to experience needle-stickand sharp object injuries compared to those working in the outpatient department. The findings highlight the importance of emphasizing the prevention of needlestickand sharp injuries among nurses in healthcare settings.
Cattani A. N., Da Silva R. M., Beck C. L. C., D 'Almeida F. M., De Lima G., Camponogara S., 2022, Brazil	Repercussions Of Night Shift Work On Nursing Professionals' Health And Sleep Quality	The methodology involved a cross-sectional study conducted with Nursing professionals working the night shift, using a socio-occupational and health symptoms questionnaire, the Assessment Scale for Work-Related Harms, and the Pittsburgh Sleep Quality Index. Data was collected between September 2017 and April 2018, and analysis was performed using descriptive and analytical statistics.	The selected population consisted of 960 Nursing professionals, including nurses, nursing technicians, and nursing assistants, who were working in a hospital institution during the data collection period. The inclusion criteria were being a nurse, nursing technician, or assistant providing direct assistance to users, while the exclusion criteria were being on leave or distanced from work during the data collection period.	Nursing professionals working the night shift experienced poor sleep quality, significantly associated with the female gender and physical illness. Poor sleep quality had a significant impact on physical, psychological, and social health of the nursing professionals. There was a statistical difference between poor sleep quality and various health symptoms and illnesses experienced by the nursing professionals.
Chen H. H., Lai J. C. Y., Chiou S. T.,	The effect of hospital-based health promotion on the health practices of	The methodology involved a nationwide, hospital-based, cross-sectional survey using a questionnaire to compare	The selected population in Hung-Hui Chen, Jerry Cheng-Yen consists of 26,011 nurses aged between	Male nurses, elder nurses, and nurses with chronic diseases were more likely to participate in hos-

Huang N., Chien L. Y., 2023, Taiwan	full-time hospital nurses: a cross-sectional study	health practices between nurses in health-promoting hospitals and non-health-promoting hospitals in Taiwan. Statistical analyses, including logistic regression models, were used to estimate the effect of health-promoting hospital status on health practices, with adjustments for participant characteristics and interaction effects with sex, age, and chronic disease.	18 and 65 years in Taiwan, who provided complete information on the variables of interest.	pital-based health-promoting activities related to sports and weight control, especially in health-promoting hospitals. Implementing health promotion programs in hospitals can improve the health practices of full-time nursing staff, suggesting the effectiveness of such initiatives. Tailored activities and incentives should be designed to promote health-related behaviors among male nurses, elder nurses, and nurses with chronic diseases.
Chiannilkulchai, N., Kejkornkaew, S., 2019, Thailand	A Comparative Study of Ampoule Breaking and Resultant Injury among Registered Nurses	The methodology involved recruiting 56 registered nurses from a university hospital in Thailand, determining the sample size based on a specific method, obtaining ethical approval, collecting data outside of work hours in a nursing laboratory room, and analyzing the data using SPSS version 21.	Population characteristics: Registered nurses (RNs) from a university hospital in Thailand, with a total of 56 participants selected based on having at least two years of clinical experience.	Breaking ampoules using a syringe bag and an outward direction had the lowest incidence of injuries and the shortest length of the sharp edge. The overall incidence rate of injuries was 10.9%, with minor injuries reported in 3 out of 73 participants. Using a material to entirely cover the ampoule neck and breaking the ampoule in an outward direction was found to reduce injuries and the length of the sharp edge.

Pich J. V., Kable A., Hazelton M., 2017, Australia	Antecedents and precipitants of patient-related violence in the emergency department: Results from the Australian VENT Study (Violence in Emergency Nursing and Triage)	The methodology involved a cross-sectional design using a survey tool distributed to members of the College of Emergency Nurses' Australasia, with input from an expert panel and a response rate of 51%.	Population size: 537 eligible responses, Population type: Emergency department nurses in Australia, Selection criteria: CENA membership, clinical work in Australian ED in the last six months, experience of violence in the last six months	Patient-related violence was common among emergency nurses, with triage nurses at the highest risk. Risk factors for patient-related violence were multi-factorial, involving nurse-related, patient-related, and emergency department-specific factors. Understanding and managing these risk factors is crucial in addressing patient-related violence in emergency departments.
Szajerska A., Grzelak L., Szostak M., 2020, Poland	The Occurrence of Pain in the Lumbar Spine in the Professional Group of Nurses	The methodology involved a diagnostic survey conducted among 165 nurses at the Specialist City Hospital in Toruń, utilizing an original survey and the Oswestry questionnaire as research tools. Data collection was carried out by distributing and collecting surveys in individual organizational units.		Occurrence of back pain in the lumbar region among nurses, with a focus on the impact of selected risk factors such as age, seniority, and BMI
Unruh L., 2018, United States	Determinants of Workplace Injuries and Violence Among Newly Licensed RNs	The methodology in Lynn Unruh (2018) involved running regressions on models with various workplace injuries as dependent variables, examining the relationship between work environment	RNs who were first licensed between 1 year and 2.5 years prior were randomly selected from Florida Board of Nursing licensure data. Only respondents who were working in hospitals (N = 414) at the	Workplace injuries such as musculoskeletal injuries, needlestick injuries, and violence are prevalent among newly licensed registered nurses in Florida, with factors like length of employment,

		factors and the incidence of workplace injuries and violence among NLRNs in Florida hospitals, and utilizing scales for job difficulties, demands, and control. The study used logistic multiple regressions and ordinary least squares multiple regression for data analysis.	time of the survey were eligible for the current study.	shift work, overtime, and job difficulties playing a role. Addressing work environment issues, especially job difficulties and demands, is crucial for effective safety programs.
Valim, M.D., Marziale, M.H.P., Hayashida, M., Richart-Martínez, M., 2014	Occurrence of occupational accidents involving potentially contaminated biological material among nurses	The methodology involved a cross-sectional study with 121 nurses, the use of a self-applied questionnaire, application of statistical tests for data analysis, and compliance with ethical standards for research involving human subjects.	Nurses were included with at least three months of professional experiences, who were not on holiday, medical leave or leave of absence. Professionals in exclusively administrative functions or not present at the place of work after two consecutive attempts were excluded. The sample was randomly composed of 120 nurses from the teaching hospital and the nurses working at the smaller establishments who complied with the inclusion criteria, totaling 39 professionals.	Accidents involving exposure to potentially contaminated biological material are frequent among nurses, and training is positively related to adherence to standard precautions. There was no significant difference in the occurrence and characteristics of occupational accidents between nurses at teaching hospitals and smaller establishments.

Valverde S., Dos Santos M., Ribeiro F., Macedo M., Da Silva L. A., Marilda Z., Resck R. R., Nogueira D. A., De Souza F., 2017, Brazil	Work accidents and self-esteem of nursing professional in hospital settings	The methodology used in the study involved a descriptive-analytical and cross-sectional design, data collection using The Rosenberg Self-Esteem Scale and a questionnaire, and data analysis using various statistical tests.	The selected population consisted of 393 nursing professionals from three hospitals in a municipality in southern Minas Gerais. The majority of the sample were female professionals, aged between 30 to 39 years, married or with a partner, identified as Catholic, and had a family income of R$1,501-	15% of nursing professionals had suffered an accident at work. 70.2% of nursing professionals presented high self-esteem. Factors like smoking, religious belief, family income, length of time working in the profession, and an outstanding event in the career were associated with work accidents and changes in self-esteem
Wesołowska-Górniak K., Nerek A., Czarkowska-Pączek B., 2024, Poland	Enhancing feedback by health coaching: the effectiveness of mixed methods approach to long-term physical activity changes in nurses. An intervention study	The Methodology involved inviting registered nurses in clinical settings to participate in an intervention study over 10 months. Data collection included various measurements, and data analysis was conducted using IBM SPSS Statistics. The study was divided into three phases: inclusion, intervention with final assessment, and follow-up measurements. Sample size analysis was performed,	The selected population consists of 106 professionally active Polish nurses working in clinical settings, predominantly female, with a mean age of 35.65 years. The selection criteria included being able to walk unassisted, willingness to wear a monitoring device, and having access to the Internet and an email address. Exclusion criteria were related to health conditions affecting physical activity.	A mixed methods approach, including feedback enhanced by health coaching, effectively achieved long-term physical activity changes in nurses by focusing on increasing leisure-time physical activity and regular risk assessment of cardiovascular events. - Participants with higher Harvard Scores were more likely to increase their daily number of steps, suggesting that knowledge about the consequences of chronic diseases may motivate individuals to change their health behaviors. - The study also

		and both descriptive and inferential statistical analyses were utilized.		showed a significant decrease in Body Mass Index and Fat Mass, indicating that the motivational strategies employed during the intervention phase influenced other healthy behaviors besides physical activity.

Appendix 2: Data analysis

Sub Category	**Generic Category**	**Main Category**
Low back pain	Musculoskeletal Disorders (MSDs)	Physical Health Threats
Musculoskeletal disorders		

Back pain syndromes		
Needlestick injuries	Needlestick and Sharps Injuries	
Sharps injuries		
Piercing-cutting materials		
Exposure to infectious diseases	Infectious Diseases	
Contaminated biological material		
Mucosa exposure	Chemical Hazards	
Patient violence	Patient-Related Violence	
Physical exhaustion		
Enhancing working conditions	Ergonomic Interventions	Current Preventative Measures

Updating facilities		
Syringe bag use	Needlestick Prevention Programs	
Breaking ampoule outwards		
Training on needlestick injuries		
Understanding needle safety	Infection Control Protocols	
Promoting physical activity		
Mucosa exposure training	Chemical Safety Protocols	
Supportive policies	Work Environment Improvements	
Health education on physical health		
Online courses		