Relationship between Nursing Work Environment Satisfaction, Use of Body Mechanics and Nurses Reported of Fatigue

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Abstract

Background: The appropriate application of body-mechanics principles during direct and indirect patient care can reduce fatigue and musculoskeletal injury. *Aim:* The present work investigated the relationship between nursing work environment satisfaction, use of body mechanics, and nurses reported of fatigue. *Design:* This descriptive comparative study recruited nurses who worked in the medical and surgical units across two hospitals in the Suez Canal region of Egypt. *Method:* The sample comprised 160 nurses. The tools of the study included Nurses' characteristic questionnaire, Observational checklist about use of body-mechanics principle, nurses' knowledge questionnaire, fatigue severity scale, and nursing work-environment satisfaction questionnaire. *Results:* It was shown that most nurses properly employed the body mechanics concepts. The study also revealed a significant strong association between nurses' knowledge and application of the principles of body mechanics in both groups. There was a considerable moderate positive association between fatigue severity scores and both scientific and applied scores of body mechanics among nurses in both hospitals. There was a mild negative correlation between nursing work-environment satisfaction scores and scientific and applied scores of body mechanics and fatigue severity scores among nurses at the Suez Canal University Hospital. *Conclusion:* The results revealed a negative correlation between the nursing work environment, applied body mechanics, and fatigue severity. Strategies to mitigate fatigue and preserve the nurses' energy were used by environmental and occupational health authorities. Management should support work environment-related activities that are associated with fatigue among Egyptian nurses to reduce and eliminate its occurrence.

Keywords: body mechanics, fatigue, nursing work environment satisfaction

Introduction

In hospitals, nurses comprise most of the front-line personnel. Because they offer the utmost care and handling, they have regular and extended interaction with patients; these duties can be severely debilitating and adversely affect nurses' quality of life and performance (**Kochitty & Devi, 2015; Shieh et al., 2016**). Physically hard occupation and indirect care duties including moving and lifting heavy things (such as equipment and patients), frequent movement, and walking may also cause tiredness (**Ibrahim & Elsaay, 2015; Argubi-Wollesen et al., 2017; Richardson et al., 2019**).

Appropriate knowledge and application of body-mechanics principles are necessary for nurses' work. Moreover, appropriate implementation of body mechanics principles is important for a healthy nursing career and should be used daily, regardless of the type of practice (**Vidya et al., 2014; Hossein et al., 2019, Olalla et al., 2020**). Therefore, they can reduce the strain on muscles and optimize coordination between nervous systems and the

musculoskeletal for maintaining posture, body alignment, and balance during activities (**Ibrahim & Elsaay, 2015; Kochitty & Devi, 2015; Kang, 2017**).

Applications of body-mechanics principles is essential for the nursing profession, health-state compensation agencies, industry employers, as well as insurance firms. Prevention of fatigue may minimize compensation expenses, lost time, insurance premiums, training, and recruitment expenses, and can often enhance the quality and efficiency of care (**Rogers, et al., 2013; Richardson et al., 2018**). Moreover, researchers have associated decreasing performance in healthcare professionals with fatigue, which is described as a feeling of depletion, tiredness, or low energy (**Knupp et al., 2018).**

When shifting patients, nurses may get physically fatigued or tired because of being subjected to strenuous physical tasks like heavy lifting and awkward postures (**Barker & Nussbaum, 2010; Cochran, 2021**). Injuries to nurses and negative health implications for patients are strongly linked to exhaustion. Health care settings differ in terms of stress, workload, and other environmental elements that may affect tiredness levels). Physically hard occupation and indirect care duties including moving and lifting heavy things, frequent movement, and walking without proper application of body-mechanics principles may also cause tiredness (**Reme et al., 2014).** As a result, nurse tiredness has been identified as a risk to both patient and nurse health (**Silva et al., 2018**).

Several aspects of the working environment must be considered to address nurse tiredness due to the complex nature of patient care (**Yan et al., 2018**). Environmental factors such as extended working hours, inadequate unit layout leading to excessive walking, infrequent or irregular breaks, and inadequate staffing have been found to contribute to nurses' fatigue and have been associated with an increased risk of injury, decreased performance and response time, and a rise in unsafe lifestyle behaviors (**Wu et al., 2018).** Fatigue management systems could help

to provide more healthy nursing work environments. Preventing manual handling could preserve nurses' energy and improve their quality of life; the nursing profession has made it one of its highest priorities to increase both the effectiveness and the quality of patient care (**Retsas, & Pinikahana, 2000**).

Nurses' fatigue threatens both nurse and patient safety. Additionally, it has a detrimental impact on the nurses' physical and emotional health and in terms of work satisfaction. There is also an effect on the healthcare organization since nurses are more likely to be absent, they have a greater desire to quit their jobs, and there is an increase in turnover (**Fang et al., 2008**). To avoid tiredness and musculoskeletal damage when caring for patients, nurses should constantly and routinely implement the concepts of body mechanics into their daily routines (**Han et al., 2014).**

A sense of fatigue as a direct result of occupational activity is referred to as work-related acute fatigue, and it may be seen as a protective human reaction to professional responsibilities (**Boakye et al., 2018; Alahmadi & Alharbi, 2018).** Health and safety regulations have resulted in continued attention on this issue in both Western and non-Western countries. However, there has been a minimal study on the fatigue experienced by Egyptian nurses and related factors.

Significance of the study

The nurse is at risk every day to fatigue, while providing patient care, as nursing care may contain strenuous physical effort such as patient transferring in and out of bed during daily care. fatigue is costly for both the nurse and the hospital costly, for the nurse as it results in decrease effort, quality of life, hinder effective nursing performance, and costly for the hospital because nurse is not able to provide the required level of nursing care. In Egypt, fatigue affects nearly 50% of the country's population and nursing profession presents the highest prevalence of fatigue compared with any other occupation (**Elbejjani et al., 2020).**

Aim of the study

This study aims to investigate the relationship between nurses' work-environment satisfaction, application of body-mechanics principles, and reported fatigue.

Objectives

The present study was, therefore, undertaken among nurses with the following objectives:

- Determine proper use of body mechanics among nurses
- Assess the severity of fatigue among nurses
- Determine the association between nurses' work-environment satisfaction, application of body-mechanics principles, and reported fatigue.

Research question

Is there relation between nursing work environment satisfaction, use of bod mechanics and nurses reported of fatigue?

Subjects and method

Research design

The present study investigates utilized a descriptive comparative approach to determine the relationship between nurses' work-environment satisfaction, application of body-mechanics principles, as well as reported fatigue.

Setting

The study was conducted in the Suez Canal region in the two largest hospitals of the Port Said and Ismailia governorates, which are dominant in terms of area and population. The study was conducted at the El Salam Hospital in Port Said, which involved 200- beds, and the Suez Canal University Hospital in Ismailia governorates, which is university-affiliated and has 350 beds, with an occupancy rate of around 85% for each.

Subjects

The non-probability sample comprised 160 nurses who worked in the medical and surgical units (80 from each hospital) and participated in the direct patient care, having a minimum working experience of 1-year, who were free from chronic cardiovascular conditions. The exclusion criterion was nurses having musculoskeletal disease. The participants of the study group were female, which reflected the fact that women comprise the majority of the clinical nursing staff in Egypt and for homogeneous purposes. All participants had a diploma degree.

The sample size was calculated based on the following formula (Sahai & Khyrshid, 1996)

$$n \geq \frac{Z^2 \ X \ O^2}{d^2} =$$

$$\frac{(1.654)^2 \ X \ (0.99)^2}{(., 148)^2} = 145$$

Confidence 90%

Sample Size is = 160 nurses

The drop rate will be 10% of the studied patients (The percentage sample dropout is calculated according to previous studies on nursing, the dropout is calculated as 10% because of the absenteeism from work, excessive preoccupation during work, or interruption from work. due to illness or personal circumstances.)

Tools for data collections

Five tools were utilized for data collection

Tool I Nurses' characteristic questionnaire: this tool was developed to assess the personal demographic characteristics as (age, working experience, over-time hours, and training courses received about body mechanics).

Tool II. Observational checklist about use of body-mechanics principles this tool was developed by the researchers to observe the use of body-mechanics principles among nurses while performing patient-handling activities (including positioning and moving patients in beds, transferring patients from beds to wheelchairs, and transferring patients from beds to trolleys. Based on previously published research, the researcher developed the observational checklist for the proper execution of such movements based on review of literature (Potter, et al., 2016; Taylor et al., 2019), it contained 10 essential nursing performances items related to the proper performance of body mechanics. The instrument used a five-point Likert scale ranging from one (Unacceptable Performance) to five (Distinguished Performance). Seven nurses from affiliated hospitals pre-tested the observation checklist changes were made to improve readability after the pre-test.

Tool III. Nurses' knowledge questionnaire – it was developed by the researchers to collects data about nurses' knowledge regarding using of body mechanics it included three main rules. The first, is to assess the situation carefully before acting as, unnecessary equipment should be out of the way of the nurse and patient, usually near the head or foot of the bed. The second rule is to use the large muscle groups of the legs, whenever possible. The third rule is to perform work at the appropriate height for body position. The questionnaire consisted of 11questions, constructed as five-point Likert scale ranging from one (strongly disagree) to five (strongly agree). The higher score signified higher utilization of the body-mechanics principles. The content validity was ascertained by a panel of Egyptian nursing educators and researchers. According to the panel's suggestions, several statements were reworded. According to Cronbach's alpha, the reliability of the instruments in this research was 0.86.

Tool IV. The Fatigue Severity Scale

The Fatigue Severity scale was designed by (Krupp, LaRocca, Muir-Nash, J., and Steinberg (1989) to assess fatigue during nurses' work; A seven-point Likert scale comprising nine items was employed in the study. The amount of fatigue felt throughout the work hour was assessed, with a higher score indicating more fatigue.

In the research by Lee et al. [30], the instrument reliability evaluated by Cronbach's alpha was 0.93; in the current investigation, Cronbach's alpha was 0.87. The Fatigue Severity Scale has good validity when compared with other scales that measure the same concept, supporting its use as a research tool.

Tool V Nursing work-environment satisfaction questionnaire. The tool was designed by the researchers to assess nursing work environment satisfaction. The tool employed a five-point scale comprised of the following nine items: professional knowledge of body mechanics; physical work environment (e.g., structure, organization, as well as the layout of the nursing work stations); did the

equipment in the hospital allow the proper practice of body mechanics?; was there a restriction on the number of electrical outlets and are they near the ground or the ceiling; availability of equipment and assistive devices; were there extended work hours; and were there any current facility or organizational norms for safe patient handling followed? (Such as two-person lifts, utilization of lift equipment, inadequate staffing, and infrequent or irregular breaks). The instruments were tested by a panel of seven external expertise validators before data collection for clarity, comprehension and content validity. before data collection. Afterward, A pilot study was carried out on 10% of the study nurses to test the clarity of questions, to make sure that items were understood, and to estimate the time necessary to complete it. All nurses involved in the pilot study were later excluded from the study sample.

Collection of data

Before starting this study, administrative approval was taken from authorities in the setting. Nurses characterises, nurses' knowledge questioners (Tool I, Tool III) were filled from the studied nurses to gather the sociodemographic characteristics and knowledge about the use of body techniques principles and it take 30 minutes, the observational hours (tool II) were selected between 8:00 and 12:00 AM because of the high degree of nursing care provided during these hours. Direct observation of the nurses was performed to avoid influencing the nurses' decisions, the researchers did not intervene in their activities. The researchers examined and documented the nurse's pre-determined behaviours on an observation as well as fatigue severity scale, Nursing work-environment satisfaction questionnaire, (Tool VI, Tool V) was completed by every nurse. Data were collected from June 2020 to February 2021.

Ethical consideration

Ethical approval was obtained from the third researcher as well as the participating hospitals (Reference no. IRB 13/2/2022(10). The researchers met with the nurses who

volunteered to participate in the study to explain the study and ensure participation eligibility Nurses were informed that collected data would be coded with identification numbers on the questionnaires, observation checklist, and computerized database and that no identifiable personal information would be used or released in any research materials or shared with their employer.

Statistical analysis

SPSS-25 was used to do a statistical analysis of the data. The data were descriptively analysed by calculating the percentages, frequencies, as well as means ± SD. To assess changes in research variables depending on participant characteristics, the independent t-test was utilized. Pearson Product-Moment Coefficients were used to examine relationships. Hierarchical multiple regressions have been utilized for determining the correlations between scientific knowledge and applications of body mechanics, fatigue, and nurses' work-environment satisfaction, in the two-hospital setting. At P=0.05, the results were deemed significant statistically.

Results

Table 1 shows the demographic characteristics of the studied nurses. The age of the studied nurses in both groups ranged from 22 to 24 years with averages of 22.70±0.91 and 22.97±0.65, respectively. The nurses in Suez Canal University Hospital had a significantly (P=0.045) higher percentage (41.3%) of working overtime compared to those of El Salam Hospital (26.3%). The percentage that had received training about body mechanics was 31.3% among the Suez Canal University Hospital nurses and 28.8% among the El Salam Hospital nurses, P>0.05 indicates that there is no statistically significant difference.

Table 2 shows a significantly higher (P<0.001) average score for the four sub-domains of applying body-mechanics principles among nurses at the Suez Canal University Hospital than nurses at the El Salam Hospital.

Table (3) shows the apparent diagnostic fatigue scale among studied nurses. The average score was significantly (P=0.003) higher among nurses at the Suez Canal University Hospital.

Table (4) shows that the average total scores of nurses' knowledge and applied principles of body mechanics were significantly higher (P<0.001) in the Suez Canal University Hospital than the El Salam Hospital. The fatigue severity scale gave the same results. The average nursing work-environment satisfaction score did not significantly differ.

Table (5) demonstrates the relationship between scientific knowledge and the application of body-mechanics principles, fatigue, and nursing work-environment satisfaction in a two-hospital setting. There was a strong considerable positive association between nurses' knowledge about the principles of body mechanics and applied scores of body mechanics in both groups. There was a significant positive moderate association between the fatigue-severity score and both the scientific and applied scores for body mechanics among nurses in both hospitals. There was a mild negative correlation between the nursing work-environment satisfaction score and the nurses' knowledge questionnaire about the principles of body mechanics, applied body mechanics, and the fatigue severity scores among nurses at the "Suez Canal University Hospital" and these correlations were negligible among nurses at the El Salam hospital.

Table (6) The average score of Knowledge about principles of body mechanics regarding age is significantly higher among nurses with age 22 years (P<0.001), having over time (P 0.001), training course about body mechanics (P 0.003) and belonging to Suez Canal University Hospital (P <0.001). Same results are present with applied principles of body mechanics and fatigue severity. While the average work-environment satisfaction score is not significantly differed (p >0.05), but it is significantly higher among those do not having Working overtime (P 0.003) and those having training (P<0.001).

Table (1): Demographic characteristics

Items	Suez Canal University Hospital Ismailia (80)	El Salam Hospital Port Said (80)	Significance test
Age (years)	22–24 22.70±0.91	22–24 22.97±0.65	t=1.804, P=0.073
Experience	2.22±0.94	1.68±82	T=3.26 P=0.002
Marital status			
Unmarried	(65)81.25%	(70) 87.50%	
Married	(15) 18.75%	(10) 12.50%	
Working overtime	33 (41.3%)	21 (26.3%)	χ^2=4.025, P=0.045*
Training course about body mechanics	25 (31.3)	23 (28.8)	χ^2=0.119, P=0.730

Table (2): Average score of the items using body-mechanics principles

Items	Suez Canal University Hospital Ismailia Mean±SD	El Salam Hospital Port Said(80) Mean±SD	Significance test
A – To maintain the neutral centre of gravity stability	12.90±1.87	9.59±3.45	t=7.556, P<0.001
B – To maintain a broad base of support	17.45±3.21	13.20±5.05	t=6.348, P<0.001
C – The line of gravity	9.18±1.16	6.21±2.73	t=8.934, P<0.001
D – Proper body alignment	27.03±3.41	19.91±6.97	t=8.199, P<0.001

Table (3): Fatigue severity scores among studied nurses

Faculty	Mean	±SD	Minimum	Maximum	T-value	P-value
Suez Canal University Hospital	6.06	1.34	3.00	8.00		
El Salam Hospital	5.01	2.75	1.00	9.00	3.06	0.003*

Table (4): Nurses' knowledge and application of the principles of body mechanics, fatigue severity, and work-environment satisfaction

Variable	Suez Canal University Hospital	El Salam Port Said(80)	Significance test
Nurses' knowledge	46–55 (54.01±2.40)	18–55 (37.89±14.27)	t=9.964, P<0.001*
Application of principles of body mechanics	41–50(48.86±2.40)	10–50 (32.30±15.16)	t=9.649, P<0.001*
Fatigue severity	40–63 (54.93±8.46)	17–63 (40.65±12.82)	t=8.311, P<0.001*
Work-environment satisfaction	9–45(21.24±14.20)	9–45 (24.50±9.03)	t=1.734, P 0.085

Table (5): Correlation matrix between scientific knowledge and application of body mechanics, fatigue, and work-environment satisfaction among nurses

Suez Canal University Hospital

	Nurses' knowledge of principles of body mechanics	Application of principles of body mechanics	Fatigue severity	Work-environment satisfaction
Knowledge				
Application of principles of body mechanics	r=0.855, P<0.001			
Fatigue severity	r=0.403, P<0.001	r=0.446, P<0.001		
Work-environment satisfaction	r=—0.233, P 0.038	r =—0.188, P 0.096	r=—0.221, P 0.049	

El Salam Hospital Port Said(80)

	Knowledge of principles of body mechanics	Application of scientific principles of body mechanics	Fatigue severity	Work-environment satisfaction
Knowledge of principles of body mechanics				
Application of principles of body mechanics	r=0.984, P<0.001			
Fatigue severity	r=0.596, P<0.001	r=013.6, P<0.001		
Work-environment satisfaction	r=0.004, P=0.970	r=—0.017, P=0.882	r=—0.055, P 0.629	

Table (6): Relationship between demographic characteristics of the studied nurses and average scores Knowledge of principles of body mechanics, Application of scientific principles of body mechanics, fatigue severity and Work-environment satisfaction

Items	No	Knowledge of principles of body mechanics	Application of scientific principles of body mechanics	Fatigue severity	Work-environment satisfaction
Age (years)					
- 22	68	53.76 ± 3.39	48.34 ± 3.99	53.44 ± 8.58	21.84 ± 13.68
- 23	54	34.22 ± 15.42	29.11 ± 16.88	42.70 ± 13.19	23.00 ± 8.30
- 24	34	48.63 ± 6.83	43.06 ± 6.63	44.89 ± 15.38	24.53 ± 13.19
Significance test		F=61.627,P<0.001	F=49.319,P<0.001	F=13.316,P<0.001	F=0.6216,P 0.541
Working overtime					
Yes	54	50.74 ± 8.54	46.33 ± 3.39	53.20 ± 11.08	18.96 ± 10.05
- No	106	43.50 ± 14.21	37.65 ± 15.22	45.03 ± 13.06	24.86 ± 12.42
Significance test		t=3.433,P 0.001	t=3.980,P<0.001	t=3.934,P<0.001	t=3.019,P 0.003
Training course about body mechanics					
- Yes	48	50.56 ± 7.82	46.00 ± 7.51	51.23 ± 11.29	30.27 ± 13.12
- No	112	43.97 ± 14.27	38.76 ± 14.99	46.31 ± 13.42	19.70 ± 9.93
Significance test		t=3.007,P 0.003	t=3.396,P 0.001	t=2.381,P 0.019	t=5.583,P<0.001
Nurses worked hospitals					
Suez Canal University Hospital	80	54.01 ± 2.40	48.86 ± 2.41	54.93 ± 4.46	21.24 ± 14.20
El Salam Hospital Port Said	80	37.89 ± 14.27	32.30 ± 15.16	40.65 ± 12.82	24.50 ± 9.03
Significance test		t=9.964,P<0.001	t=9.9699,P<0.001	t=8.311,P<0.001	t=1.734,P 0.085

Discussion

Nurses have the potential to lead the way in improving health and health care for all, but to realize that potential, they must operate in an environment that is safe, empowering, and satisfying. Work environment variables (availability of equipment and assistive devices, their extended work hours; and organizational norms for safe patient handling) were strongly associated with differences in perceived levels of fatigue. Furthermore, organizational systems should create a supportive culture and safe work environment, maintain nurses' rights and obligations to refuse to work when they are excessively fatigued **(Boakye et al., 2018; Alahmadi & Alharbi, 2018).**

The age interquartile range of both research groups was 22–24 years in this study, reflecting the fact that young nurses had been the driving force behind bedside care. According to the findings of this study, nurses' desire to stay in clinical units can decline because of exhaustion and poor quality of life. The findings of this inquiry matched those of **Shieh et al., 2016; Karahan & Bayraktar, 2013),** who found that more than 80% of their study sample was made up of young nurses who had been the driving force behind bedside care at the hospital. These findings are especially concerning considering the existing nursing shortage and the predicted increase in the need for nursing care in the coming decades. Moreover, in terms of years of experience, the newly qualified nurses were usually responsible for bedside and patient-care activities requiring pushing, pulling, carrying, and lifting **(Chen et al.,2014).** The mean experience duration for both groups in the current study were 2 years. Nurses who lack experience might have greater difficulties in performing caring activities, which might be associated with fatigue and harm to themselves when compared with more experienced practitioners **(Boakye et al., 2018).** After five years, several studies have shown that nurses are likely to leave their job due to fatigue and musculoskeletal injury. Moreover, there is some empirical evidence that working in inappropriate physical environments might increase oxygen and energy expenditure, making nurses easily irritated, influencing the development of fatigue, and increasing unhealthy lifestyle behaviors **(Boakye et al., 2018; Chen et al.,2014).**

The participants of the current study worked in internal medicine units**. Alahmadi & Alharbi, 2018** conducted research in which they examined nurses working in internal medicine who care patients with chronic conditions and those requiring physical care who may need more frequent lifting and positioning. However, long-standing issues like uncomfortable postures with heavy lifts during shifting patients may cause nurses to become physically exhausted **(Reme et al., 2014).** If hazardous postures associated with a poor work environment are prolonged, excessive muscle contraction can lead to muscular exhaustion and injury over time **(Uysal et al., 2014; Sagherianet al., 2017; Wollesen et al., 2017; Hemed et al., 2017).** When delivering bedside care, nurses are commonly seen in an uncomfortable, awkward static posture or caring posture, described as a bending-forward stance that lasts longer than 4 hours (**Uysal et al., 2014).**

According to the findings of the current study, the participants were using their knowledge and abilities to practise good body mechanics. Furthermore, nurses at the Suez Canal University Hospital received workshops and training on how to apply body mechanics principles correctly. Nurses at the Suez Canal University complained of exhaustion more than nurses at the Port Said hospital. This finding contrasted with findings from previous studies **(Hemed et al., 2017; Olalla et al., 2020),** which found that the nurses in their study lacked basic body mechanics skills and used them incorrectly. Also, this study found the scientific working environment, in which train in body mechanics is maintained and promotes nurse's health work environment was improved knowledge and use of body mechanics correctly after were received the training program **(Hemed et al., 2017; Olalla et al., 2020).**

Moreover, A study conducted by **(Kochitty & Devi, 2015)** reported a significant enhancement in the knowledge and practice of nurses about the application of body-mechanics

principles after completing a training module. By contrast, **(Ibrahim and Elsaay, 2015),** and **(Karahan and Bayraktar, 2013)** declared that training programs that focused only on the appropriate use of body-mechanics principles were not adequate to prevent fatigue and musculoskeletal energy. A safe work environment as regards patient-lifting teams, patient-lifting equipment, as well as ergonomic arrangements is efficient in lessening fatigue and muscle strain **(Knupp et al., 2018).**

The present study revealed, that there was a negative relationship between nurses' fatigue and work-environment satisfaction. This supported previous findings that the correct application of body mechanics principles is not enough to protect nurses from fatigue as well as injury **(Richardson, et al., 2018).**

These findings add to the growing nursing outcomes research evidence showing the importance of work environment to reduce nurse fatigue and improve the quality of nursing care. Also, the current study suggests that variations in perceived degrees of fatigue are substantially linked to work-environment characteristics. It may therefore be able to minimize tiredness levels and medical error rates by changing the work environment **(Wu et al., 2018).** In addition, there is inadequate technology; the unit is poorly layout, resulting in unnecessary walking; there is insufficient personnel; staff turnover; and precepting duties are all issues **Yan et al., 2018.** Therefore, patients' safety was maintained, tiredness and injury were reduced, and overall employee satisfaction was enhanced, resulting in increased worker retention in research done by **(Yan et al., 2018).** Therefore, nurses' requirements should be considered while establishing work environments, and improving the workplace can prevent nurse fatigue and burnout because poor environment work practice results in prolonged, excessive muscle contraction that eventually leads to muscular exhaustion and injury over time. Additionally, insufficient staffing, uneven work hours, an action requiring force to lift, lower, push, pull, carry, or otherwise move, and environmental elements that affect both the mind and the body have all been linked to nurse tiredness **(Vendittelli et al., 2016).** In addition,

nurses should take on additional duties that do not require specialized competencies or are not connected to direct patient care in hospitals with insufficient support services; this increases their burden and leads to physiological stress due to poor ergonomics **(Alahmadi & Alharbi, 2018; Hemed et al., 2017; Stichler, 2013).**

The present study demonstrated that nurses work overtime. According to **(Choi & Brings, 2016)** the number of extra hours worked by nurses indicates that they need more time to accomplish their duties and may be an indication of insufficient personnel **(Alahmadi & Alharbi, 2018; Elbejjani et al., 2020).**

Conclusion

Although the majority of the nurses in this study applied the principles of body mechanics correctly while caring for patients, they still experienced fatigue in the work environment. The chief nursing officer must be aware of the causes of nurses' fatigue and the detrimental consequences of working when tired. Furthermore, monitoring of fatigue levels is recommended to reduce cognitive and physical abilities is a risk to his/her own safety as well as patient safety. Further research is required to reduce nurses fatigue and improve hospital layout.

Recommendation

It is important to consider fatigue an organizational risk. Working conditions have a significant impact on nurses' fatigue as well as health outcomes. Organizations should reduce fatigue among nurses by providing medical equipment that facilitates the proper application of body mechanics, and hospital facilities should ergonomically support the prevention of exhaustion.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article

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