Relationship between Utilization of Body Mechanics and exposure to Low Back Pain among Nurses working in Orthopedic Department

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Abstract

Background: *Orthopedic nurses are at higher risk for low back damage while providing patient care, so correct body mechanics are essential for a healthy occupation.* ***Aim:*** *This study aimed to identify the relationship between utilization of body mechanics and low back pain among nurses working in the orthopedic departments.* ***Design:*** *A descriptive correlational research design was utilized.* ***Setting:*** *The study was carried out in three hospitals Benha University, Toukh Central Hospital, Benha Teaching Hospital It included all nurses in orthopedic department.* ***Subjects:*** *A convenience sample of seventy nurses (**70**) was recruited from the mentioned settings. (**20**) nurses from Benha University Hospital, (**40**) nurses from Toukh Central Hospital, and (**10**) nurses from Benha Teaching Hospital.* ***Tools:*** *Tool I: Nurses' Socio demographic and Clinical Data Structured Questionnaire, Tool II: Nurses' Utilization of Body Mechanics: Observational Checklist, Tool III: Low Back Pain Assessment.* ***Results:*** *The majority of the studied nurses (75.7 %) had LBP, 100% of them had unsatisfactory utilization of body mechanics.* ***Conclusion****: No statistical correlation between body mechanics and low back pain. Also, the majority of the studied nurses didn't receive any training, and didn't practice proper body mechanics.* ***Recommendations:*** *Replication of the study on large probability sampling.*

Key Words: Body Mechanics, Low Back Pain, Nurses, Orthopedic

Introduction

LBP and the associated loss in working days hamper the continuity of nursing care and the provision of a quality nursing service. Compared with other departments, orthopedic patients have greater physical dysfunction and require surgery. Nursing care for orthopedic patients may require strenuous physical effort, such as patient transfers in and out of bed during daily care. This puts the nurse at greater risk of low back injuries every day. Moreover, LBP is also costly for the nurse and the hospital. Costly for the hospital because the injured nurse is unable to give the necessary degree of nursing care and the treatment is expensive. Costly for the nurse because it causes pain, disability, and hinders effective nursing performance (Richardson et al., 2019).

Low back pain occurrence in nurses among all specialists ranges between 40% and 97.9% when compared with other persons in society (Alnaami et al., 2019). Several studies have revealed that the main occupational risk factors associated to LBP in nurses are lifting and moving patients, persistent positions, job organization, inadequate ergonomic structures, improper

work design, unsatisfactory social support, poor job satisfaction, staff shortages, and bad working environments (Abd El-Rasol & Abd El Rahman, 2018).

Multidimensional approaches are used to decrease back pain; they incorporate use of correct body mechanics, which means preserving optimal posture during everyday nursing tasks such as moving, lying in bed, sitting, standing, pulling, pushing, and walking. These practices need to be repeated flexion and extension of the nurse's joints. (El-Sol et al., 2018). Hence, the primary aim of the current study is to identify the relation between utilization of body mechanics and exposure to low back pain among nurses in orthopedic department.

Aim of the Study

This study aimed to identify the relationship between utilization of body mechanics and exposure to low back pain among nurses working in orthopedic department.

Research question

What is the relationship between utilization of body mechanics and exposure to low back pain among nurses working in orthopedic department?

Materials and Method

Materials

Design: Descriptive correlational research design was utilized to accomplish this study.

Settings: The study was conducted at three hospitals:

- Orthopedic department at Benha University Hospital, Benha Governate: It is composed of 8 main units, 3 for males and 3 for females and 2units for isolation.
- Orthopedic department at Toukh Central Hospital: It is composed of 5 main units, two for males and two for females and one private.
- Orthopedic department at Benha Teaching Hospital: It is composed of 3main units, 2 for males and one for females.

Subjects: All nurses working in the previous settings were assigned in the present study; they comprised of 70 nurses :(20) nurses from Benha University Hospital, (40) nurses from Toukh Central Hospital, and (10) nurses from Benha Teaching Hospital.

Tools: Three tools were used to accomplish aim of the study:

Tool one: Nurses' Socio demographic and Clinical data Structured Questionnaire:
This tool was developed by the researcher after reviewing the relevant literature (Belay et al., 2016; Husky et al., 2018). It was used to assess nurses' socio demographic and clinical data.

It was comprised of two parts:

Part I: This part covered data related to the studied nurses' socio-demographic characteristics such as: age, gender, marital status, qualification, years of experience, attendance training about body mechanics (when and where).

Part II: This part covered clinical data: It included two subcategories:

- **Health history** such as previous hospitalization, medical and surgical history, medication taken, presence of low back pain, number of pregnancy, sleeping pattern, shoes style, smoking.
- **Anthropometric measurements** as weight, height, and body mass index.

Tool two: Nurses' Utilization of Body Mechanics: Observational Checklist. This tool was developed by the researcher after reviewing the relevant literature (Berman, 2016; Smeltzer et al., 2017). It was used to assess nurses' practices regarding proper body mechanics during the actual nursing care.

It was comprised of two parts:

Part I: It was used to assess the nurses' practice regarding body mechanics during practice of the general physical tasks including: standing, sitting, stooping, gait (walking), pivoting, pushing and pulling, carrying and lifting.

Part II: The second part was used to assess nurses' practice regarding body mechanics during patients handling: including moving patient to sitting position. Assisting patient to sit on the side of the bed (Dangling), and transferring patient from bed to wheel chair and vice versa.

Scoring system

Each nurse practice was scored through a 3 point Likert scale as following:

- Correct and completely done =3
- Correct but incompletely done =2
- Incorrectly done or not done=1

These scores was converted into a percentage score and classified as following:

- Scoring of 70% and above was considered as satisfactory.
- A score less than 70% were considered unsatisfactory.

Tool three: Low Back Pain Assessment:

This tool was developed by the researcher after reviewing the relevant literature (Swearingen, 2016). It was used to assess nurse's history regarding low back pain, pain characteristics, behavioral and physiological manifestations.

It was comprised of four parts:

Part I: This part covered pain history such as onset, location, and quality, aggravating and alleviating factors, and coping strategies; past treatments and their effectiveness; review of health care pain clinics.

Part II: This part covered behavioral responses of pain such as facial expressions including: grimacing, facial tension, furrowed brow, and vocalization include: moaning, groaning, sighing, and crying.

Part III: This part covered physiologic responses of pain include vital signs, physiologic signs such as warm, dry skin, dilated pupils, perspiring, flushing, diaphoretic, pallor.

The scores of the items were summed-up and the total divided, giving a mean score as following:

- 0 = No Pain
- 1-3 = Mild Pain
- 4-7 = Moderate Pain
- 8 = Severe Pain

Part IV: Nurses' Pain Numeric Rating Scale:

This part was adopted from Scherer et al. (2018) for subjective estimate of nurses' levels of low back pain. It is a standardized linear scale; the score ranged from 0-10 corresponding to degree of pain in the lower back. A score of zero indicated no pain, a score of 1 up to 3 indicated mild pains, 4 up to 6 indicated moderate pains, 7 up to 9 denotes severe pain, and a score of 10 indicated worst possible pain.

Method

- Approval from Research Ethics Committee, Faculty of Nursing, Alexandria University was obtained. An official permission was obtained from Research Affair Committee, Faculty of Nursing, Alexandria University. An official permission was obtained from the hospital director and head of the departments of the selected hospital setting after explanation the aim of the study.
- Study tools number I, II, and III part I, II, III were developed by the researcher after reviewing the related literatures, and tool III part IV was adopted from Scherer, et al. (2018) by the researcher.
- Study tools number I and III were translated into Arabic language and tool II was used in English.
- All tools were tested for content validity by three experts in the Medical Surgical Nursing field and two experts in the orthopedic field.

- The tools were modified accordingly as regards clarity and comprehensiveness of questions and items on the tools.
- All tools were tested for its reliability and ascertained using Cronbach alpha test. The data was analyzed; the correlation coefficient for tool II was 0.972 and tool III was 0.903, which means that the tools were reliable.
- A pilot study was carried out on 7 staff nurses from Benha university hospital. The necessary modifications were done accordingly. These nurses were excluded from the current study.
- Study tools number I, III were distributed to nurses during their break time and asked to fill them in the presence of the researcher and return them back. Data were collected from the beginning of September 2021 to the end of February 2022 .
- Body Mass Index was calculated according to **WHO** (2023) by measuring weight and height. BMI = weight (Kg) /height (m) 2. It was asserted as the following:
  Underweight if BMI < 18.5
  Normal weight if BMI 18.5 – 24.9
  Over weight if BMI 25 – 29.9
  Obese if BMI >30. (WHO, 2023)
- Nurses' utilization of body Mechanics observational checklist was used to assess utilization of body mechanics (Tool II)**.** Each nurse was observed three times in the morning, afternoon and evening shifts at the selected orthopedic departments using tool II on daily basis from morning, afternoon and evening shift; around one to two nurses were observed daily by the researcher through concealed observations.

Ethical considerations:

- Written informed nurses' consent was obtained from nurses and witness from head nurse before data collection after providing appropriate explanation about the purpose of the study.
- Confidentiality of data collection was assured.
- Nurses' privacy was asserted.
- The subjects were assured that they have the right to withdraw from the study at any time without any penalty.

Statistical Analysis

The collected data were organized, tabulated and statically analyzed using the statistical package for social studies (SPSS) Version 25.0.Quantitative data were described using number and percent. Quantitative data were described mean ± standard deviation. Finally analysis and interpretation of data were conducted. P-values of 0.05 or less were considered statistically significant (Armonk, NY: IBM Corp, 2021).

Results

Table 1 shows that (57.1%) of studied nurses were from toukh central hospital. Also, (47.1%) of studied nurses were between 30 > 45years old, while 12.9 of them were between 18>25 and 45 – 60 years old respectively. The majority were females and married (85.7%), (80.0%) respectively. In relation to Qualification, the highest percentages, (48.6%) had bachelor degree. The majority (92.9%) of studied nurses didn't receive any body mechanics training.

This **table 1** also revealed that, (55.7%) of the studied nurses had no previous hospitalization and (51.6%) of them were hospitalized for caesarean sections. While only 11.4% of the studied nurses were suffering from diseases. 37.5% of them were suffering from arthritis.

Moreover, regarding the anthropometric measurements of the studied nurses, the mean and standard deviation of the nurses height and weight were (163.57 ± 6.58) and (79.37 ± 14.05) respectively. As for body mass index of the studied nurses, (44.3%) of nurses were overweight and 37.1% of them were obese, while only 18.6% were within normal weight, (29.71 ± 5.26).

Table 2 presents that 100% of the studied nurses possess an unsatisfactory practice level in relation to nurses' utilization of body mechanics.

Figure 1 considering severity of low back pain, the results shows that; the highest percentage of the studied nurses (41.5%) had moderate low back pain, while only (39.6%) of them had mild low back pain.

Table 3 illustrations that there is no statistically significant relation between the nurse's level of education and their pain severity. Also that there is no statistically significant relation between the nurse's attendance training about body mechanics and their pain severity level.

Table 4 illustrations that there is no significant difference between nurse's clinical data characteristic and their pain severity. However, it was found that a higher pain severity level was more prevalent among those nurses were overweight.

Table 5 illustrations that although there is no significant difference between nurse's utilization of body mechanics and their pain severity. However, it was found that a higher pain severity level was more prevalent among those nurses in sitting position, stooping, lifting and carrying, gait, moving patient to sitting position and assist patient to sit on the side of the bed (Dangling).

Concerning pulling and pushing, there are statistical significant difference between pulling and pushing, and pain severity at ($p=0.028^{*}$) which indicates that nurses' nothing pain severity have the highest practices mean percent scores.

Discussion

Nursing is one of the professions with the highest rates of back problems at work. As a result of the physical demands of their work, nurses frequently experience back problems. Direct and indirect costs associated with only back injuries in the healthcare setting are estimated to be $20 billion annually. (Ross, 2021). With an estimation of 40,000 nurses reporting sickness from back pain each year, back problems and related consequences in health care provider account for almost a quarter of a million lost workdays yearly in Dhahran, Eastern Province, Saudi Arabia ((Alziyadi & Elgezery, 2021).

Regarding age, the results of the current study showed that nearly half of studied nurses were in the age group 30–45years old, indicating that nurses have been the main powers for inpatient hospital bedside nursing care. Sometimes nurses' are required extended hours, including long day shifts and long night shifts, because of absenteeism and shortage of staff. These results are consistent with the study done by D'Souza et al. (2020) entitled " Knowledge and usage of body mechanics among Class IV workers" who revealed that, nearly half of the study participants were between age group of 36-45 years old.

Regarding gender and marital status, the current study revealed that the majority of them were female and married. This might be due to the fact that there are more female nurses working in hospitals than male nurses, as nursing education in the past was specialized only for females, and the majority of the nursing force working in Benha University hospitals are females. This finding is in line with study done by Ali and Abd Elal (2022) entitled "Assessment of Knowledge and Practice of Nurses towards uses of Body Mechanics Techniques" found that the majority of the nurses were females and married. It emphasized that the majority of nursing force working in Sohage university hospitals are females and their culture discourages men from becoming nurses.

In relation to qualifications, this study illustrated that the highest percentage of the studied nurses had a bachelor degree. This could be related to that most of nurses need to raise their level of education and professional advancement to improve patient care

outcomes. This finding comes in accordance with the study done by Ali and Abd Elal (2022) entitled “Assessment of Knowledge and Practice of Nurses towards uses of Body Mechanics Techniques” reported that most of nurses had Bachelor degree. However, this finding contradicts the findings of the study done by Hemed et al. (2017) entitled “Effect of Educational Program on Nurses' Performance Regarding Body Mechanics” who found that the majority of the studied nurses had a diploma degree related to shortage of high graduated nurses attached and working at Zagazig University Hospital who were always busy with administrative duties.

Regarding attendance training programs about body mechanics, the majority of the studied nurses didn't receive any training programs about body mechanics since obtaining their qualification. This could be attributed to increased staff workload and fatigue, which impedes their ability for independent self-learning and knowledge updating. Furthermore, throughout the duration of employment, there is a lack of information resources, such as a procedure manual and written policy, about the principles of body mechanics at the department as well as lack of teaching programs, conferences and workshops at the hospital. These findings are consistent with other studies done by Hijam et al. (2020) entitled "Effectiveness of Ergonomic Training Program on Knowledge, Self-efficacy and Practice on Prevention of Work Related low Back Pain among Staff Nurses" reported that all of the staff nurses had no training regarding body mechanics.

Concerning previous hospitalization, medical, and surgical histories, the current study revealed that the majority of the studied nurses had no previous hospitalization, no medical, and no surgical history. This could be related to the majority of nurses were relatively young (30-45 years). This finding is consistent with other study done by Almaghrabi, & Alsharif (2021) entitled "Prevalence of low back pain and associated risk factors among nurses at king abdulaziz university hospital " reported that a relatively small number of participants had been admitted to hospital as they had no history of medical illness or surgery.

In relation to body mass index, the findings of the study illustrate that the highest percentage of the nurses were overweight. This was supported with the study by Yossria etal, (2019) entitled "Relation between body mechanics performance and nurses’ exposure of work place risk factors on the low back pain prevalence", mentioned that most of the nurses were overweight. As the weight increases, it becomes a burden on the musculoskeletal system, which decreases the abdominal and back muscles strength and increases the level of lumbar lordosis affecting the nursing work (Samaei et al., 2017).

In relation to nurses’ use of body mechanics, the findings of the study revealed that all nurses had unsatisfactory levels of practice related to body mechanics in standing, sitting, stooping, gait (walking), pivoting, pushing and pulling, carrying and lifting. This unsatisfactory level of practice may be caused by poor unit layout (poor ergonomic designs), had not received any training program about body mechanics, remained standing for long periods, performed interventions that required bending forward, lifted and repositioned patients, and did not use any aiding equipment during interventions. Also there weren't enough time to use body mechanics technique in quick transfers.

These results are consistent with the study done by Alshahrani (2020) entitled " Prevalence of Low Back Pain among Nursing Staff in Najran, Saudi Arabia" who found that the nurses experienced difficulty in lifting and carrying weight, experienced difficulty with prolonged standing, experienced difficulty in

handling patients, and having problems pulling and pushing weights. This might be associated with decreasing nurses' work capacity, and various work stressors associated with the nursing profession which might lead to sick leave.

The findings of the study revealed that all nurses had unsatisfactory levels of practice related to body mechanics in moving patient to sitting position. Assist patient to sit on the side of the bed (Dangling), and transfer patient from bed to wheelchair and vice versa). From my point of view, this is due to a sum of causes: they do not have any information about body mechanics technique or have received any training; there isn't enough nursing staff to help me while lifting or transferring sick or heavy things; there isn't enough equipment to help me with the use of body mechanics technique; and there isn't enough space to use body mechanics technique.

These results are consistent with study by Rawat et al. (2017) entitled " Knowledge assessment on the use of Body mechanics and Safety measures among ward attendants in selected hospital of Dehradun, Uttarakhand" they reported that most of the studied nurses had improper use of body mechanics, especially regarding turning, moving, lifting, positioning, moving, and transferring the patients. In addition, the studies conducted by Ravneet et al. (2021) entitled "Assess knowledge and use of body mechanics practices and its association with musculoskeletal problems among hospital attendants in selected wards of PGIMER, Chandigarh" concluded that most of the nurses had poor practice regarding body mechanics. Furthermore, the study done by D'Souza et al. (2020) entitled " Knowledge and usage of body mechanics among Class IV workers" stated that the majority of class IV workers poorly used body mechanics at workplace while the minority was using proper techniques.

Regarding severity of back pain, the study results showed that a high percentage of nurses experienced moderate and mild low back pain this could be related to nurses experience tremendous physical stress by virtue of their work responsibilities. These results were supported with study done by Alshahrani (2020) entitled "Prevalence of Low Back Pain among Nursing Staff in Najran, Saudi Arabia" who reported that the majority of nurses had mild to moderate LBP, with no functional limitations. This may have been due to the fact that the nurses had localized LBP without radiation.

The present study also documented that no correlation was exited between LBP and age, although it was noticed that, nurses from 30 to 45 years old had more experienced low back pain as more exposure to work load and stress as well as patient care activities. This result agreed with the study by Shieh et al. (2016) entitled" Increased low back pain risk in nurses with the high workload for patient care: A survey illustrate that there is no association between age and the incidence of LBP, as younger nurses were more occupied with frequently shifting patients' positions, lifting and transferring patients with physical limitations, and other activities that put younger nurses under physical strain due to the poor ergonomics of hospital equipment.

The current study shows that no significant statistically relation between gender of the studied nurses and severity of back pain. However, the majority of the studied nurses suffering from low back pain were females. This could be could be related to anatomical, physiological, and structural differences between the sexes as well as lower number of male nurses involved in the study. This result was approved by Alshahrani (2020) study entitled "Prevalence of Low Back Pain among Nursing Staff in Najran, Saudi Arabia‖" who recorded a higher incidence of back pain among female than male nurses.

The mean while study recognized that no correlation was existed between back pain and their marital status. Additionally, the results revealed a high incidence of LBP among married nurses than unmarried. This might be related to, the fact that LBP is more common among married nurses due to specific physical circumstances in women as; physical changes due to monthly menstruation, pregnancy, labor and delivery of children as well as marriage increases the duties of female nurses in the work, and increases pressures at home which lead to increased risk for LBP. These findings supported by Almaghrabi and Alsharif (2021) study entitled" Prevalence of low back pain and associated risk factors among nurses at king abdulaziz university hospital" revealed that, there is no significant relationship between the prevalence of LBP and marital status.

The current study also recognized that no correlation was between back pain and their qualification. Despite having the biggest existed proportion of well-educated nurses has Bachelor degree, LBP rates are raising among them. This might be related to less knowledgeable in the proper techniques of lifting and body mechanics and involved in direct patients care and higher workloads. This result was approved by Samaei et al. (2017) study entitled "Prevalence of low back paın among nurses working in Elmak Nımer Universıty Hospıtal" who recorded there was no significant relation between prevalence of LBP and education level as demographic variables.

The present study revealed that there was no a statistically significant relation between LBP and having a training program about body mechanics. These results are consistent with Al Amer (2020) study entitled "Low back pain prevalence and risk factors among health workers in Saudi Arabia" who found that nurses, who had not received any training program about back pain, remained standing for long periods, performed interventions that required bending forward, lifted and repositioned patients, and did not use any aiding equipment during interventions, experienced more pain and had higher average pain scores.

The present study documented that no correlation between back pain and previous hospitalization, medical and surgical history as the majority of nurses were relatively young (30-45 years) and suffering from mild to moderate degree of LBP tolerance of pain. This could be related to working without changing positions for a prolonged period, as well as lifting/transferring patients and increased patient load, which can be reversed by taking rests. This result was accepted by Alshahrani (2020) who carried out a study entitled "Prevalence of Low Back Pain among Nursing Staff in Najran, Saudi Arabia" and found that, the occurrence of LBP among the relatively young population may be assumed to be caused by work-related stresses rather than actual chronic diseases or age-related changes, which could enhance the severity and prevalence.

There was no significant relationship between body mass index and low back pain in the present study. Although low back pain is more common among nurses, being overweight causes back pain by putting more pressure on the spine. On the same line, Margadant et al. (2020) carried out a study entitled "The Nursing Activities Score per nurse ratio is associated with in-hospital mortality, whereas the patients per nurse ratio is not" who reported that nurses who are obese or over weight suffer the most serious back injuries.

The main findings of the current study revealed that there was no a statistically significant relation between practicing body mechanics and nurses degrees of back pain. In this context, Li et al. (2019) a study carried out entitled "A cross-sectional survey of low back pain in nurses working in orthopedic departments "stated that no

relationship between body mechanics and back pain. Finally, Back pain is a serious health problem affecting nurses and they should give importance to their well-being. The findings of the current study alarming and point to a need for solutions and certain strategies should be adopted toward reducing the problems and challenges of back pain.

On the other side, Yan et al. (2018) study entitled "Correlation analysis between work-related musculoskeletal disorders and the nursing practice environment, quality of life, and social support in the nursing professionals" who reported that there was a positive significant correlation between the use of the body mechanics and nursing activities and back pain. Also, Kalyani (2019) study entitled "Assess prevalence of low back pain and its effect in daily activities among staff nurses" showed that there was a highly statistically significant difference between back pains, body mechanics performance. In addition, Alshahrani (2020) study entitled "Prevalence of Low Back Pain among Nursing Staff in Najran, Saudi Arabia"reported that LBP was strongly associated with working in the same position for prolonged periods, lifting/transferring of patients, and increased patient load, awkward bending or twisting of the back, and lifting or transferring dependent patients were significantly associated with the incidence of LBP

Conclusion

The results of the present study contradict the research question as no significant relationship between nurse's practice of body mechanics and low back pain. In addition, most of the studied nurses had back pain and all nurses had unsatisfactory level of practice regarding to body mechanics.

Recommendations

In line with the findings of the study, the main recommendations are:

- Training program about proper body mechanics should be introduced in the workplace to reduce the problem of low back pain among the nurses working in orthopedic department.
- Replication of the study on large probability sampling.

Table (1): Percentage distribution of the studied nurses according to their socio demographic and clinical data.

Nurses socio demographic	Studied nurses (n=70)	
	No	%
Age		
• 18-	9	12.9
• 25-	19	27.1
• 30 -	33	47.1
• 45 – 60 years	9	12.9
Gender		
• Male	10	14.3
• Female	60	85.7
Marital status		
• Single	12	17.1
• Married	56	80.0
• Widowed	2	2.9
Qualification		
• Bachelor of Nursing	34	48.6
• Nursing Technician	15	21.4
• Nursing Diploma	21	30.0
Attended training about body mechanics		
• No	65	92.9
• Yes	5	7.1
Previous hospitalization		
• No	39	55.7
• Yes	31	44.3
Medical history		
• No	62	88.6
• Yes	8	11.4
Anthropometric measurements		
Body mass index		
• Normal (18.5-24.9) kg/m2	13	18.6
• Overweight (25.0-29.9) kg/m2	31	44.3
• Obesity (30.0-39.9) kg/m2	26	37.1

Table (2): Percentage distribution of the studied nurses according to their total practices scores.

Percentage score of nurses' utilization of body mechanics	Unsatisfactory (<70%)		Satisfactory (≥70%)	
	No.	%	No.	%
• **Standing position**	69	98.6	1	1.4
• **Sitting position**	70	100.0	0	0.0
• **Pushing and pulling**	70	100.0	0	0.0
• **Stooping**	70	100.0	0	0.0
• **Lifting and carrying**	70	100.0	0	0.0
• **Gait (walking)**	70	100.0	0	0.0
• **Moving patient to sitting position**	70	100.0	0	0.0
• **Assist patient to sit on the side of the bed (Dangling)**	70	100.0	0	0.0
• **Transferring patient from a wheelchair to bed**	70	100.0	0	0.0
Overall	**70**	**100.0**	**0**	**0.0**

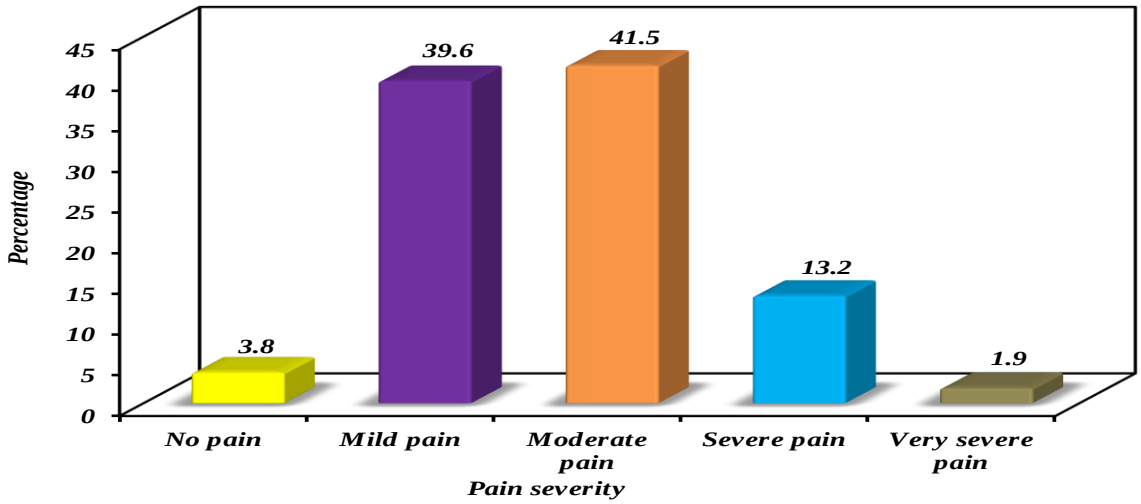

Figure (1): percentage distribution of the studied nurses regarding Pain severity

Table (3): The relation between the studied nurse's pain severity and their socio demographic characteristics.

Socio demographic characteristics	Pain severity (NRS)									
	No pain (n = 2)		Mild pain (n = 21)		Moderate pain (n = 22)		Severe pain (n = 7)		Very severe pain (n = 1)	
	No.	%	No.	%	No.	%	No.	%	No.	%
Age										
18 > 25 years	1	50.0	4	19.0	3	13.6	0	0.0	0	0.0
25 > 30 years	0	0.0	8	38.1	6	27.3	1	14.3	0	0.0
30 > 45 years	1	50.0	5	23.8	10	45.5	5	71.4	1	100.0
45 – 60 years	0	0.0	4	19.0	3	13.6	1	14.3	0	0.0
χ^2 (p)	10.195 (0.617)									
Gender										
Male	0	0.0	5	23.8	3	13.6	0	0.0	0	0.0
Female	2	100.0	16	76.2	19	86.4	7	100.0	1	100.0
χ^2 (p)	2.747 (0.596)									
Marital status										
Single	1	50.0	4	19.0	2	9.1	1	14.3	0	0.0
Married	1	50.0	17	81.0	18	81.8	6	85.7	1	100.0
Widowed	0	0.0	0	0.0	2	9.1	0	0.0	0	0.0
χ^2 (p)	8.146 (0.525)									
Qualification										
Bachelor of Nursing	0	0.0	8	38.1	12	54.5	5	71.4	1	100.0
Nursing Technician	1	50.0	7	33.3	6	27.3	0	0.0	0	0.0
Nursing Diploma	1	50.0	6	28.6	4	18.2	2	28.6	0	0.0
$\chi 2$ (p)	7.865 (0.410)									
Attendance training about body mechanics										
No	2	100.0	19	90.5	21	95.5	6	85.7	1	100.0
Yes	0	0.0	2	9.5	1	4.5	1	14.3	0	0.0
χ^2 (p)	2.901 (0.725)									

χ^2: **Chi square test** *: Statistically significant at $p \leq 0.05$

Table (4): The relation between the studied nurse's pain severity and their clinical data.

Clinical data	Pain severity									
	No pain (n = 2)		Mild (n = 21)		Moderate (n = 22)		Severe (I can't stand it) (n = 7)		Very severe (I can't) (n = 1)	
	No.	%	No.	%	No.	%	No.	%	No.	%
Previous hospitalization										
No	1	50.0	11	52.4	10	45.5	4	57.1	1	100.0
Yes	1	50.0	10	47.6	12	54.5	3	42.9	0	0.0
χ^2 (p)	1.612 (0.947)									
Medical history										
No	2	100.0	19	90.5	16	72.7	5	71.4	0	0.0
Yes	0	0.0	2	9.5	6	27.3	2	28.6	1	100.0
χ^2 (p)	5.955 (0.167)									
Body mass index										
Normal	1	50.0	4	19.0	4	18.2	0	0.0	0	0.0
Overweight	0	0.0	10	47.6	9	40.9	4	57.1	1	100.0
Obesity	1	50.0	7	33.3	9	40.9	3	42.9	0	0.0
χ^2 (p)	5.645 (0.775)									

Table (5): Relation between the studied nurse's utilization of body mechanics and their pain severity.

Pain severity	N	Standing position	Sitting position	Pushing and pulling	Stooping	Lifting and carrying	Gait (walking)	Moving patient to sitting position	Assist patient to sit on the side of the bed	Transferring patient from a wheelchair to bed	Overall body mechanics
		Mean ± SD.	Mean ± SD.	Mean ± SD.	Mean ± SD.	Mean ± SD.	Mean ± SD.	Mean ± SD.	Mean ± SD.	Mean ± SD.	Mean ± SD.
No pain	**2**	25.0 ± 7.07	6.25 ± 8.84	10.71 ± 5.05	8.33 ± 11.79	10.0 ±.0	8.33 ± 11.79	14.29 ±.0	10.0 ± 7.07	0.0 ± 0.0	8.48 ±.63
Mild	**21**	24.76 ± 10.78	5.36 ± 6.34	2.72 ± 5.29	14.29 ± 10.91	14.76 ± 9.81	11.11 ± 12.17	21.43 ± 10.83	15.24 ± 9.01	0.0 ± 0.0	10.12 ± 3.28
Moderate	**22**	20.0 ± 14.80	6.82 ± 8.39	1.30 ± 2.82	8.33 ± 9.96	19.09 ± 7.50	8.33 ± 12.33	17.53 ± 10.27	15.23 ± 8.79	0.0 ± 0.0	9.05 ± 2.76
Severe	**7**	18.57 ± 9.0	8.93 ± 11.89	5.10 ± 5.40	7.14 ± 8.91	17.14 ± 11.13	9.52 ± 13.11	20.41 ± 6.43	16.43 ± 13.14	0.0 ± 0.0	9.95 ± 2.89
Very severe	**1**	10.0	25.0	7.14	33.33	20.0	33.33	21.43	25.0	0.0	15.18
F (p)		0.784 (0.541)	1.524 (0.210)	2.992*(0.028*)	2.363 (0.066)	0.955 (0.441)	1.045 (0.394)	0.565 (0.689)	0.440 (0.779)	–	1.306 (0.281)

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