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RESEARCH ARTICLE

RISK FACTORS THAT CONTRIBUTE TO THE DEVELOPMENT OF LOWER BACK PAIN AMONG OPERATION ROOM NURSES IN PALESTINIAN HOSPITALS

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ABSTRACT

Background: Lower back pain is a common health problem among nurses, however no previous studies have investigated the prevalence of it and the factors that contribute to lower back pain among nurses who are working in the operation rooms in Palestinian hospitals. Fortunately, measures can be taken to prevent or relieve lower back pain episodes. If prevention fails, simple home treatment and proper body mechanics can be used to relieve the lower back.
Aim: The current study was conducted in order to investigate the factors that contribute to lower back pain among nurses who are working in operation rooms in north Palestine.
Method: The current study utilized a descriptive design, and data was collected using self-report questionnaires from all nurses who are working in operation rooms.
Result: 32 nurses were surveyed in the current study, 75% (n=24) of operative nurses complain of lower back pain: 34% (n=11) had sharp lower back pain, and 59.4% (n=19) intermittent back pain. The result shows a statistically significant (X2: 6.45, df: 2, P: 0.03) effect of standing for hours in relation to experiencing lower back pain amongst nurses who are working in operation rooms.
Conclusion: the study concluded that there is a significant effect of standing for long hours on developing low back pain among nurses who are working in the operation room.

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INTRODUCTION

Low Back pain is considered one of the leading causes of disability, decreased physical activities at work, and absenteeism (Hurwitz, Morgenstem and Chiao, 2005). Prevalence of low back pain among nurses was found to be higher than among other professionals, and this can be explained by the high workload and work conditions (Wong, Teo and Kyaw, 2010). In the nursing profession, nurses have been recognized to have higher risk of developing back pain (Yassi and Lockhart, 2013), because of work-related health hazards such as patient transfer (June and Cho, 2010). also one of the occupational groups that are frequently affected by LBP are nurses, due to physical effort of handling patients, hospitals' equipment and the work related emotional stress on a daily basis (Ghilan, Al-taiar, Yousfi, Al zubaidi, Awadh and Al-obeyed, 2013). Different studies were conducted on various occupations such as nursing, reporting that there is a strong association between musculoskeletal disorders relating to LBP and work related factors, while psychosocial factors and work pressure did not shown clear evidence regarding LBP development among nurses (Maul, Läubli, Klipstein and Krueger, 2002). Pain is defined as a defense mechanism designed to make the subject protect an injured part from further damage (Sikiru L., S Hanifa S., 2010). Back pain (also known as "dorsopathy") is pain felt in the human back that may come from the muscles, nerves, bones, joints or other structures in the spine (Rashid, 2013). Back pain may be continuous or intermittent in frequency, the location of pain could be felt in different regions in the back or may radiate to other body parts, also it may equally be a dull or sharp ache, or burning sensation (Rashid, 2013). Low back pain if classified as acute or chronic pain according to the duration of the back pain complaint, with chronic lower back pain lasting more than three months (Maul *et al*., 2002). While non-specific lower back pain (LBP) is known to be multifactorial, there is extensive literature from across the globe indicating a high prevalence of back disorders in nurses (Yassi and Lockhart, 2013). This study aimed to investigate the factors that

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contribute to lower back pain among nurses who are working in operation rooms in north Palestine.

MATERIALS AND METHODS

Research Design

The current study employed a descriptive design to investigate the study aim.

Ethical Consideration

The current study was approved by the scientific research committee in the Department of Nursing and the Academic Research Committee at the Deanship of Academic Research and obtained prior to the data collection phase. Also, the ethical committee for private and public hospitals approved of this study being conducted in the hospitals, ethical approval was obtain prior to data collection. The data of participants were kept in a closed cabinet at the Department of Nursing-Arab American University/Jenin where no one but the research team has access to the files. The survey is anonymous, therefore no name or identification information is required. However, all information obtained by the survey was kept confidential. The participants' permission was sought prior to data collection. They were asked to sign a cover letter to assure their voluntary participation. Participants were assured that the data were used only for the purpose of this study.

Research setting and sampling

Setting: the current study was conducted at a private and a public hospital in north Palestine. Sample and sampling: the study sample included all nurses who were working in operation rooms in both private and public hospitals in north Palestine and have working experience of more than 6 months in the operation room.

Data Collection Process

Self-report questionnaires were developed by the author following the literature review that was conducted to investigate risk factors that contribute to developing lower back pain, also an author-developed demographic survey was distributed to all nurses working in operation rooms at selected hospitals. The study was conducted in four hospitals in North Palestine (Rafedia hospital in Nablus, Al-Arabi Specialized Hospital in Nablus, St. Luke's Hospital, and Nablus Specialized Hospital in Nablus).

Instrumentation

After reviewing literature about lower back pain, a questionnaire was created for collecting data; the questionnaire is organized into three parts: Part one: Include independent variable (age, gender, nursing qualification, work place: private or governmental, years of experience, operating room experience, shift work, BMI, how many work hours the nurse stands during the day, and whether the nurse experiences LBP. Part two: consists of questions that can describe the characteristics of low back pain. Part three: consists of questions related to the history of LBP, and methods that used to manage LBP.

Statistical analysis

The collected data for this study were analyzed and tabulated using the Statistical Package for Social Sciences (SPSS) software. The results of the research showed the prevalence of operative nurses who got LBP which was 24 (75%). To ensure the reliability, Cronbach's coefficient alpha was estimated to test the internal consistency among the items included in each of the formative scales. The resulting alpha values for this study are (0.853), which are acceptable according to Nunnally and Bernstein's (1994) guidelines for exploratory research.

RESULTS

Descriptive statistics

The total number of participants was 59 nurses, all of which were working in the operation room. 32 nurses completed the questionnaires. Of the included nurses (N=32), 37.5% (n=12) were female and 62.5% (n=20) were male. The age distribution among participants nurses was 18.8% (n=6) of nurses were aged between 20-25 years, 18.8% (n=6) of nurses were aged between 26-30 years, 12.5% (n=4) of nurses were aged between 30-35 years, 12.5% (n=4) of nurses were aged between 35-40 years, and 37.5% (n=12) of nurses were aged equal to and more than 41 years. The results showed that 78.1% (n=25) of nurses have diploma degree in nursing, while 21.9% (n=7) of nurses have baccalaureate degrees in nursing. 56.3% (n=18) of nurses work at private hospitals and 43.8% (n=43) of nurses work at public hospitals. Regarding the clinical experience, the results showed 18.8% (n=6) have 0-3 years, 18.8% (n=6) have 4-7, and 62.5 (n=20) have more than 7 years of clinical experience at hospital, while the clinical experience in the operation room was 0-3years, 4-7years and more 7 years, and the results showed 28.1 (n=9), 25% (n=8) and 49.9% (n=15) respectively.

Table 1. Description of the characteristics of nurse participants (N=32)

Variables	n (%)
Gender	
Male	20 (62.5)
Female	12 (37.5)
Age	
20 - 25 years old	6 (18.8)
26 - 30 years old	6 (18.8)
31 - 35 years old	4 (12.5)
36 - 40 years old	4 (12.5)
$\geq$ 40 years	41 (37.5)
Academic Qualification	
Diploma Degree	25 (78.1)
Baccalaureate Degree	7 (21.9)
Hospital	
Private	18 (56.3)
Public	14 (43.8)
Clinical experience in hospital	
0-3 years	6 (18.8)
4-7 years	6 (18.8)
> 7 years	20 (62.5)
Clinical experience in operation room	
0-3 years	9 (28.1)
4-7 years	8 (25)
> 7 years	15 (49.9)
Shift Duty	
Only A	21 (65.6)
A , B , C	11 (34.4)
Hours standing continuously	
< 3 hours	3 (9.4)
3-5 hours	9 (28.1)
> 5 hours	20 (62.5)

65.6% (n=21) of nurses were working on "A" Shift, while 34.4% (n=11) were rotated among "A, B and C" shift. Also, the result revealed 62.5% (n=20) of participants were standing more than 5 hours, 28.1% (n=9) were standing 3-5 hours, and 9.4% (n=3) were standing less than 3 hours. As shown in Table 1.

Table 2. Description of pain characteristics among nursing participants (N=24)

Variables	n (%)
Back Pain	
Yes	24 (75)
No	8 (25)
Location of Back Pain	
Right side of back	5 (15.6)
Left side of back	5 (15.6)
Middle of back	14 (43.8)
Type of Back Pain	
Sharp pain	11(34.4)
Dull pain	5 (15.6)
Cramping spasm pain	6 (18.8)
Itchy back pain	2 (6.3)
Frequency of Back Pain	
Continuous pain	5 (15.6)
Intermittent pain	19 (59.4)
Severity of Back Pain	
Mild pain	5 (15.6)
Moderate pain	16 (50)
Severe pain	3 (9.4)
Aggravating factors of Back Pain	
Moving	6 (18.8)
Bending	10 (31.3)
Lying down	3 (9.4)
Coughing /Sneezing	1 (3.1)
Straining	1 (3.1)
Moving in bed	2 (6.3)
Any position	1 (3.1)
Alleviating factors of Back Pain	
Rest and Sleep	15 (46.9)
Analgesia	6 (18.8)
Both (Rest and Analgesia)	3 (9.4)
Radiation of Back Pain	
Not radiating	7 (21.9)
Left leg	7 (21.9)
Right leg	5 (15.6)
Both legs	3 (9.4)
Both arms	1 (3.1)
Both legs and arms	1 (3.1)

The back pain characteristics were investigated among participants and the result in Table 2 showed that 75% (n=24) of participants have back pain and 25% (n=8) didn't have back pain; among those who have back pain (n=24) it was found that 15.6% (n=5), 15.6% (n=5), and 43.8% (n=12) of back pain was located on the right side, left side, and in the middle of back respectively. 34.4% (n=11) of participants felt sharp back pain, 15.6% (n=5) felt dull pain, 18.8% (n=6) felt cramping spasm back pain, and 6.3% (n=2) of participants felt back pain like itching. The duration of back pain among participants was 59.4% (n=19) of them have intermittent back pain, while 15.6% (n=5) have continuous back pain. The severity of back pain was divided into mild, moderate, and severe, which is revealed by the following results: 15.6% (n=5), 50% (n=16) and 9.4% (n=3) respectively. The back pain was aggravated among 18.8% (n=6) of participants by movement, 31.3% (n=10) by bending, 9.4% (n=3) by lying down, 3.1% (n=1) by coughing and sneezing, 3.1% (n=1) by straining, 6.3% (n=2) by moving in bed, and 3.1% (n=1) by any position. The result showed that 46.9% (n=15) of participants used sleep and rest to relieve their back pain, while another 18.8% (n=6) of participants use analgesic medication to relieve their back pain, and 9.4% (n=3) of them used both of these techniques to relieve their back pain. Regarding back pain radiation the result revealed that 21.9% (n=7) of participants said their back pain radiated to the left leg, 15.6% (n=5) radiated to the right leg, 9.4% (n=3) radiated to both legs, 3.1% (n=1) radiated to both arms, 3.1% (n=1) radiated to both legs and arms (Table 2). The frequencies of participant nurses' responses to the questions regarding back pain is shown in Table 3.

Inferential Statistics

The result of the study shows that there is a statistically significant (X^2: 6.45, *df*: 2, *P*: 0.03) effect of standing for hours on experiencing back pain among participant nurses who are working in the operation room, while there is no statistically significant (X^2: 0.71, *df*: 1, *P*: 0.33) relationship between the gender of participant and back pain.

DISCUSSION

The findings of the current study reveal that the prevalence rate of back pain among nurses who are working in operation rooms was 75%, this result is consistent with Hinmikaiye and Bamis (2012) who found that 78.15% of theatre nurses developed lower back pain. Regarding the location of the back pain, the current study revealed that 43.8% of operation room nurses complain of back pain in the middle of their back, while nurses with different specialization found their pain was located in the lower region of the back (77.19%) (Hinmikaiye and Bamis haiye, 2012). This could be related to different nursing tasks such as bending, carrying patients, torso twisting and standing (Rezaee *et al*., 2014) inside the operation room,

Table 3. Frequencies of participant nurses' responses to the questions regarding back pain (N=32)

Question	Yes: n (%)	No: n (%)
Did you experience back pain before you started your work in this hospital?	6 (18.8)	26 (81.3)
Do you feel uncomfortable when standing for a long time?	27 (84.4)	5 (15.6)
Do you have pain in your upper back and neck?	12 (37.5)	20 (62.5)
Do you have pain in your lower back?	24 (75)	8 (25)
Do you have pain in your lower back and legs?	18 (56.3)	14 (43.8)
Did you complain of numbness or parathesia in your leg or foot?	9 (28.1)	23 (71.9)
Do you feel muscle spasms in your lower back after standing for a long time?	23 (71.9)	9 (28.1)
Do you think that long periods of standing is related to your low back pain?	25 (78.1)	7 (21.9)
Have you ever left your shift because of back pain?	9 (28.1)	23 (71.9)
Has your back pain ever woken you from sleep?	13 (40.6)	19 (59.4)
Do you have rest when you feel pain during a shift?	16 (50)	16 (50)
Is the back pain forcing you to change your work?	7 (21.9)	25 (78.1)
Do you use preventive techniques in your work to prevent back pain?	8 (25)	24 (75)
Do you use medication to relieve back pain?	16 (50)	16 (50)
Have you ever had physiotherapy?	9 (28.1)	23 (71.9)
Have you had Chreopatic [CHIROPRACTIC?] therapy?	-	32 (100)
Have you had any medical or surgical interventions related to back pain?	7 (21.9)	25 (78.1)

and on the general nursing floor, all of which nursing tasks increase the amount of pressure that the lumbar region receives (Hinmikaiye and Bamis, 2012). In addition, it is difficult to describe pain, because everyone reacts so differently to it. Among the participant nurses, the study revealed that 34.4% of them felt sharp pain, 15.6% felt dull pain, 18.8% felt cramping spasm back pain, and 6.3% of participants felt back pain like itching. A different study conducted by Bing (2004) reported that 81.6 % of participants describe their back pain as being dull, and 14.3% described it as being tight/stiff back pain. The findings of this study regarding the severity of back pain consistent with Bing's (2004) finding, which reveals that more than 50% of participants have intermittent pain. The back pain was aggravated among 18.8% of participants by movement, and 31.3% by bending; these findings are supported by Aljeesh and Al Nawajha (2011) who showed that prolonged standing, inappropriate posture, lifting and moving patients were the highest risk factors in their study. Another study that supports our results is by Shawashi, Subih, Al Hadid and Abu-Adas (2014), which showed that there is evidence that nurses perform inappropriate practices, which include inappropriate body mechanics and improper posture when carrying out in or out-of-bed patient mobilization. That is why 'transferring the patient' and 'lifting a heavy patient within the bed without assistance' were the top dynamic factors contributing to back pain. The incidence of symptoms of new low back pain increased with longer hours spent in one work posture and greater frequency of common work activities, e.g. bending to lift an item from floor level as reported by Bing (2004). The highest percentage of participants who reported that their back pain was relieved by rest and sleep was 46.9%, while another 18.8% of participants use analgesic medication to relieve their back pain, and 9.4% of them use both of these techniques to relieve their back pain, and this result does not agree with the result of Hinmikaiye and Bamis (2012) which reported that 17% of the respondents with back pain took some rest to relieve their back pain, while 36% take analgesics. Regarding back pain radiation, the result revealed that 21.9% of participants found their back pain radiated to left leg, 15.6% radiated to the right leg, 9.4% radiated to both legs, 3.1% radiated to both arms, and 3.1% radiated to both legs and arms. Lin, Tsai, Chen and Huang (2012) reported in their study that leg pain (sciatica) was bothersome for more than half of the respondents (50.33%). In addition, 68.79% of the respondents reported that the experienced pain interfered with their normal work.

Conclusion

The result of study shows that there is a statistically significant (X2: 6.45, df: 2, P: 0.03) effect of standing for hours on the experience back pain among participant nurses who work in an operation room. Measures can be taken to prevent or relieve most back pain episodes. If prevention fails, simple home treatment and proper body mechanics will often heal the back. The findings of our survey showed a high prevalence of operation room nurse participants with lower back pain: 75%. 34.4% of participants felt sharp back pain, and the back pain was aggravated among 31.3% by bending.

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