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LOW BACK PAIN AMONG MEDICAL SURGICAL NURSES IN LEBANON

by
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AN ABSTRACT OF THE PROJECT

Rasha Itani for Master of Science in Nursing
Major: Administration Track

Title: Low Back Pain Among Medical Surgical Nurses in Lebanon

Nurses throughout the world complain of low back pain. The prevalence of low back pain among nurses in Lebanon is particularly high. Low back pain among nurses anywhere is a significant occupational health issues because it affects psychosocial wellbeing, limits daily activities, and increases workforce costs due to attrition and high replacement costs.

A national survey of nurses in Lebanon provided data for a secondary analysis of low back pain among medical and surgical nurses in Lebanon. The objectives of the secondary analysis were: 1) Identify the prevalence of low back pain in registered and practical nurses working on medical surgical floors in Lebanon. 2)Investigate the relationship between demographic factors (age group, years of experience and degree/education) and low back pain among registered and practical nurses working on medical surgical floors in Lebanon. 3) Explore the relationship between nursing tasks and low back pain among registered and practical nurses working on medical surgical floors in Lebanon.

The study findings revealed a high prevalence of low back pain among 1084 (registered and practical nurses working on medical and surgical floors throughout Lebanon.

There was no significant association between demographic factors and low back pain.

There was a marginal association between specific nursing tasks and low back pain.

A highly reliable scale for measuring nursing tasks has been constructed for validation in future studies.

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CHAPTER I

INTRODUCTION

A. Background

Historically, low back pain has been a major worldwide health problem among healthcare providers especially nurses, and it still poses one of the highest risks to nursing employees (Boughattas et al., 2017, Dlungwane, Voce and Knight, 2018). Pain is defined by the International Association for the Study of Pain (IASP,1994) as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage". Low back pain refers to a pain that happens in the dorsal area, below the 12th rib and above the gluteal folds (Oyedero,2016; Tosunoz and Oztunc, 2017). Low back pain can spread down the lower limbs and cause serious problems that could impact on nurses' health and work efficiency (Tosunoz and Oztunc, 2017; Alkenani et al., 2016; Yan et al., 2017).

Low back pain is the second most common diagnosis after upper respiratory tract diseases (Oyedero, 2016). Nurses are ranked third on the prevalence rate of low back pain among all health care providers (Oyedero, 2016). In addition, low back pain ranks the second reason for nurses to leave the profession and retire (Tosunoz and Oztunc, 2017; Sikiru and Hanifa, 2010). The result of a survey done in Hong Kong showed that 16.2% of nurses' sick leaves are due to low back pain (Oyedero, 2016).

The European Foundations revealed that 35% of employees suffer from musculoskeletal disorders, in which low back pain is the most serious and significant problem (Oyedero, 2016). It was revealed by Oyedero (2016) study that low back pain percentage was the highest among nurses who work on medical and surgical floors. A

systematic review done by Soylar and Ozer, (2018) showed that the prevalence of back pain among nurses' ranges between 49 to 84% . A cross sectional study done among 520 nurses in Iran showed that nurses experience 88% of musculoskeletal disorders(MSDs) in at least one body region were low back pain consumes 65.3% (Arsalani, Fallahi-Khoshknab, Josephson & Monica Lagerström, 2014). The incidence of low back pain is in a continuous increase among health care providers especially nurses, placing the nursing profession at risk (Oyedero, 2016, Boughattas et al., 2017).

The association of related factors and prevalence of low back pain among nurses has been documented in a number of studies. A cross-sectional study designed by Luan et al. (2018) was conducted to determine the prevalence and factors associated with MSDs among nurses in Vietnam over a 6-month duration, from January to June 2017. Among 1179 nurses who filled a survey-based questionnaire, 41 to 44 % had low back pain and age was a significant contributing factor associated with MSDs. Results of a study among 6674 nurses working in hospital settings revealed a low back pain prevalence of 62.71%. Oyedero (2016) cross-sectional study in Obafemi Awolowo University Teaching Hospitals in Nigeria results revealed that 71.4% of this population experience back pain,. Moreover, a study done by Dlungwane, Voce and Knight (2018) to determine the prevalence of low back pain among nurses in KwaZulu- Natal, South Africa showed that the prevalence of low back pain is 59%.

Studies done among nurses in Egypt showed a high prevalence of low back pain (79.3%) in 2012 (Joshi and Shrestha, 2015). A study done by Soylar and Ozer (2018) in Turkey revealed that low back pain raged between 49% and 84% among nurses. In the original study done by Younan et al., (2018) across 39 hospitals in Lebanon showed 84.2% of the selected population reported to experience back pain.

B. Significance

Back pain has a negative impact on the nursing profession, quality of care and nurse's quality of life since it limits daily activities; affecting their everyday life and triggering psychological problems (Oxydero,2016). Nurses' health condition affects directly the quality of care delivered to patients because they provide direct care to all patients (Oyedero,2016). Tosunoz and Oztunc (2017), mentioned in their study that nurses reported back pain to be the most painful area in their body.

Having high prevalence of low back pain among nurses is very costly on the long term; nurses are leaving the profession driving up the cost of overtime in healthcare systems (Boughattas et al., 2017). Moreover, incurred costs are associated with hiring momentary nurses and medical treatment expenses provided to nurses with low back pain (Dlungwane, Voce and Knight, 2018; Boughattas et al., 2017).

1. Purpose and Research Objectives

The aim of this project is to determine the prevalence of low back pain among registered and practical nurses working in hospitals on medical surgical floors in Lebanon; and to examine the relationship between low back pain and demographic factors, nursing tasks. The results of this study can be used to develop continuing educational sessions and professional development initiatives to fill any knowledge gap among this population. In addition, these results can be presented in international conferences because this is a worldwide alarming problem.

C. Study Objectives

1) Identify the prevalence of low back pain in registered and practical nurses working in hospitals on medical surgical floors in Lebanon.

2) Investigate the relationship between demographic factors such as (age group, years of experience and degree/education) and low back pain among registered and practical nurses working in hospitals on medical surgical floors in Lebanon.

3) Explore the relationship between nursing tasks and low back pain among registered and practical nurses working in hospitals on medical surgical floors in Lebanon.

CHPATER II

LITERATURE REVIEW

The aim of this literature review is to identify individual factors, work related factors and nursing tasks associated with low back pain among nurses. The Bibliographical search of the Medline, CINAHL, ScienceDirect, PsycINFO and PubMed yielded (21) articles dated between 2010 and 2019-time period. The search terms included pain, low back pain, Musculoskeletal disorders, nurses. Furthermore, keywords with medical subject headings (MESH) were used in advanced searches, and these keywords were joined through the use of conjunctions such as OR, AND. Articles measuring the prevalence and associated factors of low back pain among registered and practical nurses were chosen; while articles measuring other kind of musculoskeletal disorders or non-nursing healthcare providers were excluded.

A. Factors Associated with Low Back Pain

1. Age

A systematic review by Soylar and Ozer (2018) on the prevalence of MSDs among nurses revealed a significant increase in MSDs among individuals aged 45 years or older. Findings also revealed that at the age of 40 years many physiological changes occur from a decrease in muscle mass to a decrease in strength and body movements. Soylar and Ozer (2018) mentioned that as age increases the risk of developing MSDs increases gradually. In line with this idea, a study conducted by Luan et al. (2018) among 1179 nurses in Vietnam over a 6-month duration indicated that age is statistically associated with MSDs. Similarly, a study on 203 nurses working in a

hospital setting in Tunisia revealed that age is one of the major factors associated with low back pain (Boughattas et al., 2017).

2. Nursing Tasks

Besides age, studies reported that the escalation in MSD rates is statistically associated with repetitive physical activities including lifting, pulling and pushing heavy objects and patient feeding (Soylar and Ozer, 2018). Tosunoz and Oztunc (2017) stated that nursing duties place nurses at a great risk for developing low back pain due to carrying or lifting patients, positioning, assisting patient's daily activities, carrying heavy medical devices and cleaning up beds. A study conducted on surgical nurses showed that one of the main factors that causes low back pain is moving patients from bed to stretcher or vis versa (Tosunoz and Oztunc ,2017). In addition, nursing tasks such as wound dressing and bed making were also associated with low back pain. The study also indicated that the larger percentage of this population with back pain were working on medical and surgical floors (Oyedero, 2016).

3. Working Hours

A study undertaken at the University of Maryland School of Nursing, revealed that the total number of working hours per week has also been shown to be an important predictor for low back pain (Roupa et al., 2008). A cross- sectional study done among nurses by Yan et al., (2017) showed that extended working hours and increased workload increases the risk of low back pain. A study done by Dlungwane, Voce and Knight (2018) showed that there has been a significant association between nurses working for 6-month fixed schedule (where nurses work day or night shift for 6 months

straight without rotating) and low back pain ($p < 0.05$). Job rotation in the nursing profession has been strongly associated with stress and low job satisfaction, leading to low back pain (Dlungwane, Voce and Knight, 2018; Luan et al., 2018; Oyedero, 2016).

4. Psychosocial Factors

It has been confirmed that the level of anxiety a person holds affects his or her ability to concentrate resulting in loss of attention during work (Luan et al., 2018). All individuals including nurses, face many difficulties in their daily lives which ultimately adds more distress to their occupational activities. Nevertheless, anxiety and stress are the main reasons that cause and trigger MSDs including low back pain (Luan et al., 2018; Tosunoz and Oztunc, 2017). Negative situations nurses face every day increase the risk of developing low back pain, for example; nurses are sometimes obliged to stay away from their families and children in many occasions, thus this can develop stress and anxiety among nurses (Tosunoz and Oztunc, 2017).

4. Years of Experience

A cross sectional study done in Taiwan among 217 hospital nurses in order to gather data about the prevalence and factors associate with low back pain (Lin et al., 2012). Information was gathered through self-reported questionnaires and it showed that years of experience is significantly associated with low back pain among nurses ($p<0.05$). Another cross sectional study done in South India among nurses working in Christian Medical College showed that as years of experience increase, the risk for developing low back pain increases ($p<0.05$) (M Emmanuel, Ezhilarasu and B Bheemarao, 2015).

5. Level of Education

A cross sectional study done by Khorsandi et al., (2013) in Iran among 133 nurses randomly selected from 3 governmental hospitals, using self-administered questionnaires. Results showed that the educational level of nurses is not significantly correlated with low back pain ($P< 0.05$). Moreover, a cross sectional study was done by Lela (2010) to measure the prevalence of low back pain among nurses in Kanombe Military Hospital and its associated factors. 159 nurses were given three questionnaires to fill and results revealed no significant relationship between level of education among nurses and low back pain with a p value =0.852 (Lela, 2010).

CHAPTER III

METODOLOGY

A. Research Design

The original study was a descriptive correlational multi-hospital cross sectional survey design conducted in 2015. The project was a secondary analysis of the de-identified data submitted by 1084 nursing staff employed at 39 acute care hospitals in Lebanon. Secondary analysis of the data was approved by the Social and Behavioral Sciences IRB at the American University of Beirut under the procedure for exempt research studies.

B. Sampling Plan

This original study included a convenience sample of 2852 nursing staff recruited from 39 Lebanese acute care hospitals, achieving a statistical power of 80%. The sample of this study relates to medical surgical nurses that represent 23.2% (N= 1084) of the original sample. For the hospitals selected, they had at least 100 beds and administrative approval to participate. Participants comprised registered nurses, licensed practice nurses and nurse assistant who had work in inpatient units that admitted patients for at least 48 hours were included in the study.

As for this study, the sample (N=1084) inclusion criteria included: 1) registered nurses ,2) licensed practice nurses and 3) working in medical surgical units. Nurses who worked in outpatient units and with less than 1-year experience were excluded.

C. Instrument

The previously filled questionnaire Arabic version of the original study was used in this study. The meaning, clarity and fullness of the Arabic questionnaire were validated using the WHO guidelines for translation and cultural validation. Review by expert panel, back translation, pre-testing and cognitive interview were all included in the process. The questionnaire is composed of three sections:

Personal and Demographic section: includes age, gender, marital status, years of experience, nursing degree, hospital location, hospital ownership, university hospital, hospital bed number and number of bed at the unit.

Work organization section: includes work allocation, nurse to patient ration, shift hours, availability of lifting aids, staff support, nursing activities on a 6 points Likert scale (1=never, 2= very rarely, 3= sometimes, 4=frequently, 5= almost, 6= always). This instrument was adapted from ASCOPE and tested it in 11 Canadian hospitals among 285 nurses working in 22 medical units (Younan et al., 2018). The internal consistency and validity showed a 0.89 alpha coefficient (Younan et al., 2018). Patient care tasks scale indicates which health care provider, patient, family member or others carry out these tasks. Work-related musculoskeletal injuries section: includes 5 questions that indicate the incidence of musculoskeletal injuries, type, cause and severity.

D. Statistical Analysis

Data was analyzed using the Statistical Package for Social Sciences software (SPSS) version 24. Descriptive statistics were used for sample characteristics; means

and standard deviation for continuous variables, frequencies and percentages for categorical variable

Cross tabs (Chi- Square test) were calculated to examine the relationship between low back pain and demographics factors (1) age and low back pain, (2) degree/education of RN, PN and low back pain, and between RN, PN and low back pain.

A series of reliability analysis scales were conducted for RN and PN tasks. A list of 11 tasks were selected, mean, standard deviation and Cronbach alpha were calculated. Inter-item correlation matrix and item total statistics were conducted in order to see how these tasks quantify the concept of low back pain.

CHAPTER IV

RESULTS

A. Sample Characteristics

In the original study, 2852 nurses were approached; only medical surgical registered and practical nurses were included in this study resulting in a sample size of 1084. Nurses were approached in 39 Lebanese acute care hospitals.

Demographic characteristics of the sample are shown in table 1. 50.2% of the selected population were aged between 20 and 29 years. 34.5% of the selected population has between 10 and 25 years of experience. 67.9% of the selected population were registered nurses holding (TS, LT, BSN and MSN) and 32.1% practical nurses (holding nurse assistant-no degree, nurse assistant-degree and BT) in table 1.

Table 1: Demographic Characteristics of the Study Sample (N= 1084)

Individual characteristics	N	%
Age		
Less than 20	37	3.4
20-29	544	50.2
30-39	324	29.9
40-49	110	10.1
50 or more	54	5.0
Years of experience		
Less than 5	268	27.7
5- 10	317	32.8
10-25	333	34.5
25 or more	48	5.0
Degree/education		
Nurse assistant- no degree	129	12.2
Nurse assistant- degree	103	9.7
BT	108	10.2
TS	168	15.8
LT	152	14.3

BSN	356	33.6
MSN	44	4.2
Degree/classification		
RNs	720	67.9
PNs	340	32.1

B. Prevalence Of Low Back Pain In The Study Sample

In this secondary data analysis, the 12 months' prevalence of low back pain among registered and practical nurses working in hospitals on medical surgical floors revealed that out of 1084 respondents, 615 (84.7 %) nurses suffered from low back pain. In addition, low back pain was the most frequent muscular injury type reported than any other type of musculoskeletal injuries (Table 2).

Table 2: Musculoskeletal Injuries Type

	Frequency	**Percent**
Back pain	615	84.7
Other types of pain (LEG PAIN, SPRAIN AND MUSCLE TEARS, CARPEL TUNNEL SYNDROME AND OTHER)	111	15.3

C. Correlation Of Demographic Factors With Low Back Pain

In order to identify the relationships between Low Back Pain and Age, Education/Degree, RN/PN, and Years of Experience, a cross-tabulation and Chi-square tests were performed. Cross-tabulation between Low Back Pain and Age showed that nurses of 20 to 39 years old experienced more frequent low back pain than older or younger nurses within the last 12 months; yet, the p value = 0.244. Thus, results showed that this association is not statistically significant. Cross-tabulation between Low Back Pain and Education/Degree showed that RNs reported higher frequencies of back pain

than PNs, yet the association was not statistically significant (p=0.657). Cross-tabulation between Low Back pain and Education/Degree showed that the higher frequencies of low back pain were among nurses who hold no degree, followed by BSNs. Yet, the p-value did not report any statistical significance (p=0.425). Cross-tabulation between Low Back pain and years of experience showed that nurses with 5-10 years of experience had more frequent low back pain than the others. Yet, there was no association with low back pain with a p-value= 0.233.

Fisher's Exact Test p value was reported for the cross tabulation between Education/degree and low back pain, and between Age and low back pain because one or more cells had expected count less than 5. However, Pearson Chi- Square p value was reported for the cross-tabulation between RN/PN and low back pain, and between years of experience and low back pain because 0 cells had expected count less than 5.

Table 3: Cross-tabulation between Low Back Pain and Age, Education/Degree, RN/PN, and Years of Experience

	Low Back Pain			
	No	Yes	N	p-value
Age in years				0.244
<20	6 (33.3%)	12 (66.7%)	18	
20-29	53 (15.6%)	286 (84.4%)	339	
30-39	31 (13.0%)	208 (87.0%)	239	
40-49	11 (13.9%)	68 (86.1%)	79	
50 or more	6 (15.8%)	32 (84.2%)	38	
Education/Degree				0.425
No degree	7 (8.8%)	73 (91.3%)	80	
Nurse assistant	14 (17.1%)	68 (82.9%)	82	
BT	12 (17.1%)	58 (82.9%)	70	
TS	17 (14.7%)	99 (85.3%)	116	
LT	17 (16.7%)	85 (83.3%)	102	
BSN	33 (14.4%)	196 (85.6%)	229	
MSN	8 (25%)	24 (75%)	32	
RN/PN				

RN	75 (15.7%)	404 (84.3%)	479	0.654
PN	33 (14.2%)	199 (85.8%)	232	
Years of Experience				0.233
<5	29 (19.5%)	120 (80.5%)	149	
5-10	28 (12.8%)	191 (87.2%)	219	
10-25	36 (14.1%)	220 (85.9%)	256	
25 or more	7 (21.2%)	26 (78.8%)	33	

**p-value < 0.05*

D. Description Of Nursing Tasks And Their Correlation With Low Back Pain

The percentage and frequency of each nursing task done is found in table 4. The most frequent patient care tasks reported by ≥ 75% of participants to be performed by RNs are: Monitoring vital signs to evaluate treatments and complications, Pain assessment, Administration and monitoring of pain killers, Risk assessment for patient falls, Assessment of skin integrity, Starting IV lines, Monitoring IV lines, Administration of prescribed medications, Monitoring patients for medications side effects, Administration of blood transfusions, Monitoring patients receiving blood transfusions, Drawing blood samples and Inter-shift reporting.

Moreover, the most frequent patient Care Tasks reported by ≥ 75% of participants to be performed by PNs are: Positioning patients in bed to avoid complications, ambulating post-operative patients, Implementation/ assisting with: Patient hygiene e.g. bed bath, Bed-making, Dressing and undressing, Elimination (urine and stools), Feeding and Ambulation (e.g. to and from chair and walking).

In this secondary data analysis, some nursing tasks performed by RNs were significantly correlated with low back pain including: assessment of skin integrity ($p=0.020$) and Cramer's V =0.103, monitoring IV lines ($p=0.011$) Cramer's V =0.113, monitoring patients for medications side effects ($p=0.035$) Cramer's V = 0.097,

preparing patients for medical and surgical procedures (p=0.019) Cramer's V=0.104, positioning patients in bed to avoid complications (p=0.030) Cramer's V= 0.093, bed making (p=0.042) Cramer's V= 0.097, dressing and undressing patients (p=0.008) Cramer's V= 0.127, eliminating urine and stools (p=0.026) Cramer's V= 0.107, feeding patients (p=0.028) Cramer's V= 0.107; and ambulating patients (p=0.017) Cramer's V= 0.115 Table 5a.

Moreover, some nursing tasks performed by PNs were significantly correlated with low back pain including: checking and reporting blood sugar level (p= 0.002) and Cramer's V= 0.127, bathing patients in bed (p=0.048) Cramer's V= 0.091, bed making (p=0.022) Cramer's V= 0.103, dressing and undressing patients (p=0.003) Cramer's V= 0.133, eliminating urine and stools (p=0.009) Cramer's V= 0.117, feeding patients (p=0.012) Cramer's V= 0.115 and ambulating patients (p=0.01) Cramer's V= 0.119.

P-value of Fisher's Exact test was reported for all tasks (PN and RN) except for Task 26 and Task 28 where Pearson Chi-Square p value was reported because they revealed 0 cells with expected count less than 5.

E. Descriptive Statistics Of Nursing Tasks

Table 4a: Patient Care Tasks Performed Mostly by RNs

Patient Care Tasks reported by ≥ 75% of participants to be performed by RNs	**N**	**%**
Task 2: Monitoring vital signs to evaluate treatments and complications	839	77.4
Task 3: Pain assessment	927	85.5
Task 4: Administration and monitoring of pain killers	972	89.7
Task 5: Risk assessment for patient falls	877	80.9
Task 6: Assessment of skin integrity	852	78.6

Task 7: Starting IV lines	989	91.2
Task 8: Monitoring IV lines	945	87.2
Task 9: Administration of prescribed medications	997	92.0
Task 10: Monitoring patients for medications side effects	976	90.0
Task 11: Administration of blood transfusion	998	92.1
Task 12: Monitoring patients receiving blood transfusions	918	84.7
Task 22: Drawing blood samples	953	87.9
Task 29: Inter-shift reporting	929	85.7

Table 4b: Patient Care Tasks Performed Mostly by PNs

Patient Care Tasks reported by ≥ 75% of participants to be performed by PNs	**N**	**%**
Task 18: Positioning patients in bed to avoid complications	946	87.3
Task 19: Ambulating post-operative patients	888	81.9
Task 25: Implementation/ assisting with:		
a- Patient hygiene e.g. bed bath	990	91.3
b- Bed-making	990	91.3
c- Dressing and undressing	981	90.5
d- Elimination (urine and stools)	976	90.0
e- Feeding	942	86.9
f- Ambulation (e.g. to and from chair and walking)	957	88.3

Table 5a: Pearson's Chi-Square correlations between low back pain and nursing tasks

Tasks	**RNs experiencing low back pain**		**P-value**	**Cramer's V**
	Yes	**No**		
Task 1	84.3%	15.7%	0.496	0.041
Task 2	84.9%	15.1%	0.734	0.025
Task 3	85.2%	14.8%	0.420	0.051
Task 4	84.6%	15.4%	0.794	0.031
Task 5	85.2%	14.8%	0.617	0.037
Task 6	86.6%	13.4%	0.020*	0.103
Task 7	85.3%	14.7%	0.335	0.049

Task 8	86.1%	13.9%	0.011*	0.113
Task 9	85.1%	14.9%	0.540	0.037
Task 10	85.8%	14.2%	0.035*	0.097
Task 11	85.0%	15.0%	0.722	0.020
Task 12	85.7%	14.3%	0.168	0.066
Task 13	86.8%	13.2%	0.019*	0.104
Task 14	86.1%	13.9%	0.459	0.044
Task 15	85.5%	14.5%	0.631	0.032
Task 16	83.8%	16.2%	0.187	0.067
Task 17	86.2%	13.8%	0.225	0.061
Task 18	89.3%	10.7%	0.030*	0.093
Task 19	87.5%	12.5%	0.081	0.079
Task 20	84.8%	15.2%	0.341	0.053
Task 21	84.7%	15.3%	0.540	0.039
Task 22	85.5%	14.5%	0.149	0.072
Task 23	87.2%	12.8%	0.533	0.039
Task 24	84.7%	15.3%	0.387	0.048
Task 25A	89.4%	10.6%	0.053	0.094
Task 25B	90.7%	9.3%	0.042*	0.097
Task 25C	86.9%	13.1%	0.008*	0.127
Task 25D	88.1%	11.9%	0.026*	0.107
Task 25E	87.9%	12.1%	0.028*	0.107
Task 25F	86.0%	14.0%	0.017*	0.115
Task 26	85.1%	14.9%	0.886	0.019
Task 27	87.8%	12.2%	0.186	0.071
Task 28	87.2%	12.8%	0.434	0.048
Task 29	85.3%	14.7%	0.379	0.053

**p-value < 0.05*

Table 5b: Pearson's Chi-Square Correlations Between Low Back Pain And Nursing Tasks

Tasks	**PNs experiencing low back pain**		**P-value**	**Cramer's V**
	Yes	**No**		
Task 1	85.2%	14.8%	0.538	0.038
Task 2	88.0%	12.0%	0.466	0.046
Task 3	90.3%	9.7%	0.168	0.069
Task 4	93.9%	6.1%	0.367	0.056
Task 5	83.8%	16.2%	0.847	0.022
Task 6	84.1%	15.9%	0.614	0.032
Task 7	87.4%	12.2%	0.761	0.026
Task 8	84.4%	15.6%	0.830	0.017
Task 9	86.8%	13.2%	1.0	0.013

Task 10	82.3%	17.7%	0.475	0.039
Task 11	92.6%	7.4%	0.528	0.046
Task 12	85.9%	14.1%	0.350	0.053
Task 13	85.2%	14.8%	0.851	0.015
Task 14	85.0%	15.0%	0.919	0.011
Task 15	85.3%	14.7%	0.634	0.031
Task 16	89.7%	10.3%	0.002*	0.127
Task 17	86.1%	13.9%	0.327	0.054
Task 18	85.0%	15.0%	0.581	0.036
Task 19	85.1%	14.9%	0.387	0.052
Task 20	84.6%	15.4%	0.334	0.052
Task 21	84.4%	15.6%	0.541	0.039
Task 22	89.1%	10.9%	0.160	0.070
Task 23	84.3%	15.7%	0.478	0.042
Task 24	87.0%	13.0%	0.4	0.049
Task 25A	85.5%	14.5%	0.048*	0.091
Task 25B	85.8%	14.2%	0.022*	0.103
Task 25C	86.0%	14.0%	0.003*	0.133
Task 25D	86.0%	14.0%	0.009*	0.117
Task 25E	86.0%	14.0%	0.012*	0.115
Task 25F	85.9%	14.1%	0.01*	0.119
Task 26	82.2%	17.8%	0.222	0.063
Task 27	87.8%	12.2%	0.186	0.071
Task 28	84.5%	15.5%	0.965	0.012
Task 29	86.3%	13.7%	0.618	0.039

**p-value < 0.05*

F. Reliability Analysis Scale Of RN's Tasks

A case processing summary is shown in Table 6 with 1084 participants, 0 excluded.

Table 6: Case Processing Summary

Case	N	%
Valid	1084	100.0
Excluded [a]	0	0
Total	1084	100

a. Listwise deletion based on all variables in the procedure

Cronbach's alpha is **0.966,** which indicates a high level of internal consistency for the scale (Table 6.a)

Table 6a: Reliability Statistics of RN Tasks

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of items
.966	.966	11

1. Inter-item Correlation Matrix (Table 6.b)

This table resembles the correlation of every item with one another. For example, the correlation of task 10 with 8 is quite strong 0. 929.The correlation between task 25A and 25C is strong (0.911) whereas the correlation between task 6 and task 25D is relatively less in strength (0.522). The larger the value and closer to 1 the stronger the relation. All of these correlations are positive because all of the tasks that compose the scale have a strong relationship.

Table 6b: Inter-Item Correlation Matrix

	Task 6	Task8	Task10	Task13	Task 18	Task 25A	Task 25B	Task 25C	Task 25D	Task25E	Task25F_
Task 6	1.000	.734	.707	.674	.660	.606	.587	.574	.552	.531	.526
Task 8	.734	1.000	.929	.890	.757	.678	.637	.643	.600	.578	.591
Task 10	.707	.929	1.000	.861	.749	.650	.630	.617	.593	.571	.566
Task 13	.674	.890	.861	1.000	.755	.657	.636	.643	.599	.577	.608
Task 18	.660	.757	.749	.755	1.000	.765	.762	.727	.700	.675	.669
Task 25A	.606	.678	.650	.657	.765	1.000	.909	.911	.878	.848	.822
Task	.587	.637	.630	.636	.762	.909	1.000	.942	.926	.894	.869

25B											
Task 25C	.574	.643	.617	.643	.727	.911	.942	1.000	.908	.877	.869
Task 25D	.552	.600	.593	.599	.700	.878	.926	.908	1.000	.896	.854
Task 25E	.531	.578	.571	.577	.675	.848	.894	.877	.896	1.000	.891
Task 25F	.526	.591	.566	.608	.669	.822	.869	.869	.854	.891	1.000

2. Item Total Statistics (Table 6.c)

The column “corrected item-total correlation” is the correlation of each task with all the other tasks. First value 0.697 resembles the correlation of task 6 with all the other tasks in the scale. For example, task 25B has a strong correlation with all others tasks (0.909). The column “Cronbach’s Alpha if item deleted “shows the level of Cronbach alpha and how the level is affected negatively or positively if an item is deleted from the scale, therefore you can suggest removing or keeping an item from the scale. The current Cronbach’s alpha is 0.966, deleting the listed tasks would make our level minimally decrease ranging between 0.960 and 0.965, which is not a significant decrease. Cronbach’s alpha increased minimally from 0.966 to 0.967 after deleting item 6. (Table 6.c)

A reliability analysis was carried out on the perceived task values scale comprising 11 items. Cronbach’s alpha showed the scale to reach acceptable reliability, $\alpha = 0.966$. Most items appeared to be worthy of retention, resulting in a decrease in the alpha if deleted. The one exception to this was item 6, which would minimally increase the alpha to $\alpha = 0.967$.

Table 6c: Item Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Task 6	509.30	3701030.486	.697	.573	.967
Task 8	516.59	3662264.087	.807	.904	.964
Task 10	515.64	3671552.242	.786	.875	.964
Task 13	513.95	3656714.709	.789	.819	.964
Task 18	519.90	3663567.436	.831	.735	.963
Task 25A	518.30	3600761.830	.899	.872	.961
Task 25B	515.55	3573194.028	.909	.931	.960
Task 25C	513.70	3567724.585	.898	.916	.961
Task 25D	510.01	3562233.141	.872	.888	.961
Task 25E	506.32	3554911.200	.851	.870	.962
Task 25F	505.35	3556813.059	.842	.834	.963

G. Reliability Analysis Scale Of PN's Tasks

A case processing summary is shown in Table 7 with 1083 participants, 1 participant excluded.

Table 7: Case Processing Summary

Case	N	%
Valid	1083	99.9
Excluded [a]	1	.1
Total	1084	100

a. Listwise deletion based on all variables in the procedure.

Cronbach's alpha is **0.966**, which indicates a high level of internal consistency for the scale (Table 7a).

Table 7a: Reliability Statistics of PN Tasks

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of items
.966	.966	11

1. Inter-item Correlation matrix (Table 7b)

This table resembles the correlation of every item with one another For example, the correlation of task 25A with 25B 8 is relatively strong 0.909. Whereas the correlation between task 6 and task 25F is relatively less in strength (0.526). The larger the value and closer the 1 the stronger the relation. All of these correlations are positive because all of the tasks lead to the same trait (low back pain).

Table 7b: Inter-Item Correlation Matrix

	Task 6	Task8	Task10	Task13	Task 18	Task 25A	Task 25B	Task 25C	Task 25D	Task25E	Task25 F_
Task 6	1.000	.734	.707	.674	.660	.606	.587	.574	.552	.531	.526
Task 8	.734	1.000	.929	.890	.757	.678	.637	.643	.600	.578	.591
Task 10	.707	.929	1.000	.861	.749	.650	.630	.617	.593	.572	.567
Task 13	.674	.890	.861	1.000	.755	.657	.636	.643	.599	.577	.608
Task 18	.660	.757	.749	.755	1.000	.765	.762	.727	.699	.675	.669
Task 25A	.606	.678	.650	.657	.765	1.000	.909	.911	.878	.848	.822
Task 25B	.587	.637	.630	.636	.762	.909	1.000	.942	.926	.894	.869
Task 25C	.574	.643	.617	.643	.727	.911	.942	1.000	.908	.877	.869
Task 25D	.552	.600	.593	.599	.699	.878	.926	.908	1.000	.896	.854
Task 25E	.531	.578	.572	.577	.675	.848	.894	.877	.896	1.000	.891
Task 25F	.526	.591	.567	.608	.669	.822	.869	.869	.854	.891	1.000

2. Item total statistics (Table 7c)

The column "corrected item-total correlation" is the correlation of each task with all the other tasks. First value 0.697 resembles the correlation of task6 with all the other tasks in the scale. For example, task 8 has a strong correlation with all others tasks (0.807). The column "Cronbach's Alpha if item deleted" shows the level of Cronbach alpha and how the level is affected negatively or positively if an item is deleted, therefore you can suggest removing an item from the scale. The current Cronbach's alpha is 0.966, deleting the listed tasks would make our level minimally decrease ranging between 0.960 and 0.965, which is not a significant decrease because all the values are still above 0.960.

A reliability analysis was carried out on the perceived task values scale comprising 11 items. Cronbach's alpha showed the scale to reach acceptable reliability, $\alpha = 0.966$. Most items appeared to be worthy of retention, resulting in a decrease in the alpha if deleted. The scale might be important when considering muscular skeletal injuries, including back pain among nurses in Lebanon because Cronbach's alpha is 0.966 in both scales which is a high level of internal consistency.

So both scales with 11 items reliably measure back pain among nurses in Lebanon.

Table 7c: Item Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Task 6	513.56	3700975.034	.697	.573	.967
Task 8	521.04	3662004.761	.807	.905	.964
Task 10	520.29	3671100.846	.786	.875	.964
Task 13	517.96	3656830.172	.790	.819	.964
Task 18	523.18	3664298.599	.831	.734	.963
Task 25A	521.30	3601780.138	.899	.872	.961
Task 25B	518.53	3574251.700	.909	.931	.960
Task 25C	516.69	3568757.404	.898	.916	.961
Task 25D	513.01	3563320.798	.872	.888	.961
Task 25E	509.35	3555953.896	.851	.870	.962
Task 25F	508.41	3557828.059	.841	.834	.963

To conclude, the prevalence of low back pain among registered and practical nurses revealed 84.7 %, which is the most common muscular injury. There are some nursing tasks done by RNs and PNs that are significant correlated with low back pain. Whereas, demographic factors including age, degree/education, PN/RN did not reveal a significant association with low back pain.

CHAPTER V

CONCLUSION AND RECOMMENDATIONS

A. Discussion

The main purpose of the study was to determine the prevalence of low back pain among registered and practical nurses working in hospitals on medical surgical floors in Lebanon. A related purpose was to examine the relationship between low back pain, demographic factors (years of experience, degree/education, age) and nursing tasks.

Study findings revealed low back pain to be the most reported muscular injury type with a prevalence of 84.7% among nurses. More specifically, self-reported low back pain was higher in registered nurses compared to practical nurses. These findings are similar to a systematic review by Soylar and Ozer (2018) that showed the prevalence of low back pain ranges between 49% and 84%. According to the results obtained, there was no significant association between age, years of experience and low back pain among registered and practical nurses working on a medical surgical floor in Lebanon. This finding is contrary to associations between these factors reported in the literature (Boughattas et al., 2017; Luan et al., 2018; Soylar and Ozer, 2018; Roupa et al., 2008). The reasons for having no association between back pain and age or years of experience in this finding, maybe due to the younger nursing workforce in Lebanon.

Moreover, no association was found between level of education and low back pain, similarly to previous studies by Khorsandi et al., (2013) and Lela (2010). A possible reason could be the multiple-entry level to practice and the blurred demarcation

between the scope of practice of different nursing degree holders in Lebanon (Younan et al., 2019).

Although significant p values were obtained for the association between low back pain and some nursing tasks but, the effect sizes were very small, indicating that the tasks performed by the nurses did not have an important effect on low back pain. However, there are reports of an association between repetitive physical activities including lifting, pulling and pushing heavy objects, patient feeding and assisting in daily activities with low back pain (Soylar and Ozer, 2018; Tosunoz and Oztunc (2017). A study conducted on surgical nurses showed that one of the main factors that causes low back pain is moving patients from bed to stretcher or vis versa (Tosunoz and Oztunc ,2017). However, the median age of nurses in the Lebanon sample was compared to median ages of nurses in Nigeria and (Oyedero, 2016) it seems that nurses in older age groups who engage in high levels of physically demanding nursing care may be at higher risk for low back pain.

Findings of the reliability analysis scale of RNs tasks revealed strong correlation between the tasks. In addition, findings also revealed that Cronbach alpha increases minimally after deleting item 6 from the scale. Similarly, the reliability analysis scale of PNs tasks revealed strong correlation between the tasks. Cronbach's alpha increased minimally after deleting item 6.

The lack of a measure of frequency of task performance is likely the main explanation for the marginal association of nursing tasks with low back pain in the sample. Therefore, the need to document the frequency of tasks that are being done is vital. In Lebanon sample, we did not have measures of frequency of activity, only nominal data on whether or not a task was performed. Moreover, data about nurse's

perception concerning physical/mental demands and stress in the work environment shall be collected. However, no attempt to generalize the data, only low back pain prevalence can be generalized.

Many triggering factors to low back pain have been found in the literature, for example: obesity of nurses, stress, change in environment, social support and psychological high demands shall be taken into consideration because they aid in developing low back pain among nurses (Boughattas et al., 2017; Dlungwane, Voce and Knight, 2018; Younan et al., 2018; Munabi et al., 2014; Luan et al., 2018; Oyedero, 2016).

1. Strengths

The sample is large and includes RNs and PNs from 39 hospitals across Lebanon which makes it representative. Also, there is a high level of internal consistency for the scale used to measure nursing tasks. The findings confirm the importance of Back Pain (BP) as an area of focus for research on nurse's occupational health, and emphasize the need for primary and secondary prevention of Back Pain bedside nurses. Lastly, the study can be replicated.

2. Limitations

Several limitations can impact and influence the interpretation of these findings. The Data collected from a convenience sample may not be generalizable. Self-report bias might have taken place since the questionnaires relied only on the nurse's responses on low back pain. Because the study relied on secondary data, not all of the information desired was available, for example: pain was collected in an objective

manner in the questionnaire, nurses had no opportunity to describe their pain, aggravating factors, lifestyles factors of the nurses and activity of non-work time was not collected, travel time needed daily to arrive to work was not taken into account since the roads in Lebanon are in a very bad condition and this can cause low back pain. The questionnaire did not include the time spend doing these tasks which could be a vital triggering factor to low back pain regardless of its frequency. Neither did the questionnaire solicit information on the frequency with which the nurses undertook the nursing tasks specified.

3. Recommendations

For future research includes: conducting a longitudinal study in order to see how low back pain progresses and affects nurses (quality of life, job satisfaction). Including radiographic/MRI in further studies in order to detect injuries. Because low back pain is related to quality of care delivered to patients and job satisfaction among nurses it is recommended to conducts further research on possible treatment/precautions of low back pain and explore whether a decrease in low back pain can improve quality of care provided to patients and increase job satisfaction among nurses. Conduct further studies to explore other comprehensive risk factors that aid in developing low back pain and to explore whether psychological demands of nursing profession trigger low back pain.

Implications on practice includes: providing educational programs on low back pain prevention such as healthy lifestyle, balanced emotional and physical life. Provide ergonomic training in hospitals in order to reduce occupational injuries such as body posture, and muscles strengthening exercises. Regular assessment of fatigue levels

among bedside nurses to make organizational adjustments to allow adequate rest and recuperation. Tosunoz and Oztunc (2017) mentioned that low back pain among nurses is related to how the task is being done and not with the task itself. Therefore, nurses must receive educational courses about using proper body posture. Discuss in educational sessions the importance of maintaining a balanced emotional and physical life since the nursing professional is highly demanding in both. Provision of safety devices for lifting and moving patients Conclusion

As a conclusion, low back pain among nurses is a common occupational problem affecting many nurses globally. The study found a high prevalence of low back pain in the study sample. Hospital managers and directors of nursing can address this problem by providing equipment to assist nurses with lifting and moving patients and offering training on avoiding and managing low back pain in clinical units. Educational programs shall be provided to nurses about back care ergonomics in order to enhance their knowledge in this field. Nurse research can contribute to further development of preventive measures of low back pain by conducting observation studies and ensuring that frequency of physical activity is taken into account. The study met the main aim of identifying the point prevalence of low back pain in nurses working in medical-surgical units in Lebanon. A highly reliable scale for measuring task activity has been identified.

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