

ORIGINAL RESEARCH

Low back pain and coping strategies' among nurses in Port Said City, Egypt

Maha Moussa Mohamed Moussa *, Hanan Hassan El-Ezaby, Reda Ibrahim El-Mowafy

Department of Community Health Nursing, Faculty of Nursing, Port Said University, Port Said, Egypt

Received: January 24, 2015

Accepted: March 30, 2015

Online Published: April 27, 2015

DOI: 10.5430/jnep.v5n7p55

URL: <http://dx.doi.org/10.5430/jnep.v5n7p55>

ABSTRACT

Background: Low back pain is a very common health problem worldwide and a major cause of disability-affecting performance at work and general well-being. The aim of this study was to assess low back pain and coping strategies' among nurses in Port Said City.

Methods: This was a cross-sectional study of low back pain among 419 nurses working in six governmental hospitals and four primary health care centers in Port-Said City. Data were collected through face-to-face interviews using five tools.

Results: A total of 419 completed questionnaires were analyzed. The mean pain severity score was 5.8 ± 1.8 . The present study revealed that a highly statistically significant relation between pain score, perception, and coping strategies and age, body mass index, experience, and duration of low back pain among nurses complaints of low back pain.

Conclusions: More than three quarters of nurses suffered from low back pain due to long standing and more than two thirds due to heavy lifting and hospital work. With respect to strategies for coping with low back pain, positive correlations were found between withdrawal and denial as a coping strategy with age and experience.

Key Words: Low back pain, Coping strategies, Nurse

1. INTRODUCTION

Low back pain predominantly affects the working population in both developed and developing nations, leaving a number of individuals disabled.^[1-3] Chronic low back pain may originate from an injury, disease, or stresses on different structures of the body. The type of pain may vary greatly and may be felt as bone pain, nerve pain or muscle pain. The sensation of pain may also vary. For instance, pain may be achy, burning, stabbing or tingling, sharp or dull, and well-defined or vague. The intensity may range from mild to severe. Nursing is well established as a high-risk occupation for musculoskeletal disorders and, in particular, low back pain (LBP).^[4,5] Prevalence increases and peaks between the

ages of 35 and 55. As the world population ages, low back pain will increase substantially due to the deterioration of the intervertebral discs in older people, it is estimated that 3.5% of nurses are leaving the profession due to back pain.^[6,7]

Although several risk factors have been identified, including occupational posture, depressive moods, obesity, body height, and age, the causes of the onset of low back pain remain obscure and the diagnosis is difficult to make.^[8-10] Most physical risks contributing to LBP in nurses are focused on occupational factors such as extent of bending and lifting.^[11] A range of personal physical factors, including reduced cardiovascular fitness,^[12] poor back muscle endurance,^[13] altered motor control patterns,^[14] poor spinal posture,^[15] and

*Correspondence: Maha Moussa Mohamed Moussa; Email: mahamoussa10@yahoo.com; Address: Department of Community Health Nursing, Faculty of Nursing, Port Said University, Port Said, Egypt.

reduced sagittal range of motion^[16,17] have been found in various LBP populations. Further, lifestyle factors such as physical inactivity^[18] and high levels of vigorous physical activity^[19] have been associated with LBP.

Recently, there has been an increased focus on factors that may be associated with the prognosis of musculoskeletal pain, with particular interest in the significance of coping strategies and the scope for modification to improve outcomes.^[20] Coping, as defined by Hestbaek, Leboeuf, and Kyvik^[21] is a process of evaluating a stressful situation consisting of primary and secondary appraisal and responding to a stressor. Coping with medical conditions may also be influenced by the illness perceptions of an individual and emotional response to the perceived health threat.^[22] The coping strategies people use may have potential to affect the outcome of their condition. There is an abundance of cross-sectional studies,^[23,24] demonstrating an association between coping strategies and pain and disability, particularly for patients with low back pain.

2. SUBJECT AND METHODS

2.1 Research design

A cross-sectional study design was used to assess low back pain and coping strategies' among nurses in Port Said City.

2.2 Setting

This study was carried out in six governmental hospitals (EL-Naser Hospital, EL-Mobara Hospital, EL-Amiri Hospital, EL-Tadamon Hospital, EL-Zhour Hospital and Port-fouad General Hospital) and four primary health care centers (Othman Bin Afan, Omer Bin El-khatab, EL-Kuwait and EL-Monakh) in Port Said City.

2.3 Target population

The Target population for this study was female nurses working in the governmental hospitals and primary health care centers mentioned above.

2.4 Subjects

All nurses (419) available in the above mentioned settings at the time of data collection were included in this study.

Exclusion criteria: Subjects were excluded as: inflammatory disorders, neurological diseases, metastatic disease, spinal surgery and pregnancy.

2.5 Tools for data collection

Data were collected using five tools.

Tool (I): A structured interview questionnaire addressed socio-demographic data related to the nurse's age, nursing

educational levels, experience (years), marital status, workplace, duration of LBP, LBP related to position and alleviating factors.

Tool (II): A linear numerical scale developed by Boyd, 2003^[25] uses a 10-point numerical scale describing the degree of pain experienced with zero indicating no pain at all and 10 representing the worst degree of pain.

Tool (III): Perceived Meaning of Pain Inventory (PMPI): The PMPI is a norm-referenced measure designed to determine the meaning of pain as described by patients.^[26] It consists of 26 items comprising 5 scales: loss (5-items), threat (9-items), blaming others (4-items), blaming self (4-items), and spiritual awareness (4-items). Each item is followed by a 3-point scale for measuring the degree to which an item represents the subjects thoughts about pain. The Perceived Meaning of pain (26 point) ranged from 1 to 3 where 1 = never thinking, 2 = most of time thinking and 3 = all time thinking.

Tool (IV): The ways of coping questionnaire (WCQ): This scale was developed by Folkman and Lazarus (1988).^[27-29] It was used to measure cognitive and behavioral effort. The scale consists of 33 items divided into three subscales: positive coping (15 items), avoidant coping (10 items), and alleviating coping (8 items) to indicate on a (4 point likert scale) ranging from 0 to 3, where 0 = not used, 1 = used somewhat, 2 = used quite a bit and 3 = used a great deal what the enough, cope with the demands of pain. The standardized Alfa coefficient for the 35 items WCQ was 0.94 by Folkman and Lazarus (1988). The standardized coefficient for factors ranged from 0.76 to 0.84.

Tool (V): State-Trait Anxiety Inventory (STAI): This scale was developed by Spilberger *et al.* and Spilberger.^[30,31] It was used to measure distinct trait anxiety among patients with low back pain. A-State scale consists of 20 statements, asked the patients to describe how they generally feel. Subject responded on each STAI items by rating on a point scale ranging from 1 (low anxiety) to 4 (high anxiety). Alfa reliability for A-State ranged from 0.86 to 0.92 subjects respond to each STAI items by rating on a 4-point scale ranging from no anxiety (zero) to high anxiety (3-points). The 4 categories for the scoring system are 0 = not at all, 1 = somewhat 2 = moderately so and 3 = very much so.

2.6 Validity

The study tools were tested for validity by five experts; two from the Medical Surgical Nursing and three Community Health Nursing Departments of Port Said University.

2.7 Pilot study

A pilot study was carried out on 10% of the study sample to test the tools for clarity, applicability, and the time required to complete the tools. Data obtained from the pilot study were analyzed and feedback was requested concerning the wording of questions, how long it took to complete and whether any of the questions were felt to be overly intrusive. Feedback was very positive and as a result the questionnaire remained unchanged. Those who participated in the pilot study were excluded from the main study sample.

2.8 Fieldwork

Questionnaires were completed by the nurses. Data were collected from the selected settings by the researchers from the beginning of January to the end of June 2013. The research team members were present during completion of the questionnaires, and completion took 30-45 minutes for each participant.

2.9 Ethical considerations

Approval to conduct the study was obtained from the Dean of Faculty of Nursing at Port Said University and from each of the hospitals and primary health care centers. Each nurse received an explanation of the purpose of the study and how to complete the study tools. They were assured of the confidentiality of all data they provided and the use of data for research purposes only.

2.10 Statistical design

The Statistical Package for the Social Sciences (SPSS, version 16.0) was used for data analysis. Descriptive statistics were employed to summarize the demographic data, which was presented using frequency tables and expressed as percentages, means, and standard deviations. The chi-square and Fisher exact test were used to determine if any associations existed between low back pain and socio-demographic variables.

Spearman rank correlation test was used to examine (Correlation between nurses' pain, perception, coping and anxiety scores and the personal characteristics). Statistically significance was considered at p -value $< .05$.

3. RESULTS

Characteristics of low back pain (LBP) are depicted in Table 1, duration of LBP ranged from less than 2 years to more than 10years. The majority (90%) of the nurse shad LBP related to position, with more than three quarters (75.6%) attributing their low back pain to long standing. In addition, and more than two-thirds (of the nurses were suffering from low back pain due heavy lifting and hospital work (67.5% & 66.5%) respectively. Bending reported by 58.9% of the

nurses. Meanwhile pain alleviated by rest and sitting, standing after a long period and ling down as reported (68% & 40.3%) respectively. The mean pain severity score among the nurses was 5.8 (+1.8) out of 10. Regarding strategies to alleviate low back pain, (68%) of the study sample used rest and sitting. Other strategies included standing after a long period lying down (40.3%) or sitting (26.7%), sitting after walking (25.7%).

Table 1. Characteristics of low back pain (LBP) among nurses in the study sample (n = 419)

	Frequency	Percent
Duration of LBP (years):		
<2	62	15.6%
2-4	170	42.8%
5-9	96	24.2%
10+	69	17.4%
LBP related to causes	358	90.2%
Types of causes:		
Long sitting	157	39.5%
Long standing	300	75.6%
During long walking	183	46.1%
Sudden movement	171	43.1%
Heavy lifting things	268	67.5%
Bending	234	58.9%
Home chores	242	61.0%
Hospital work	264	66.5%
Waking up	118	29.7%
Alleviated by:		
Standing after a long period sitting	106	26.7%
Standing after a long period lying down	160	40.3%
After walking	102	25.7%
Rest and sitting	270	68.0%
Pain severity score (max=10):		
Range	2.5-10.0	
Mean \pm SD	5.8 \pm 1.8	
Median	5.00	

Table 2 indicates that a highly statistically significant relation was found between low back pain and age in the study sample (p -value .04). Low back pain was also significantly related to study sample having children ($p=.03$) and gravidity (.001).

Table 3 shows that a highly statistically significant relation between pain due to low back pain among the study sample with duration of LBP , nursing work affected, treatment used and used special therapies (p -value $< .001$, .008, .003, .03 & .002) respectively.

Table 4 indicates a highly statistically significant relation between low back pain and feelings of loss, feelings of thereat and anxiety ($p < .001$, .03, & .001) respectively.

Table 2. Relation between low back pain (LBP) among nurses and their personal and health characteristics

	LBP				χ^2 Test	p-value
	Absent		Present			
	No.	%	No.	%		
Age (years):						
<30	15	68.2	176	44.3	6.63	.04*
30-	6	27.3	115	29.0		
40+	1	4.5	106	26.7		
Body mass index (BMI):						
Normal (<25)	9	40.9	109	27.5	1.88	.39
Overweight (25-<30)	7	31.8	150	37.8		
Obese (30+)	6	27.3	138	34.8		
Educational degree:						
Nursing school diploma	18	81.8	354	89.2	Fisher	.29
Bachelor's degree	4	18.2	43	10.8		
Experience:						
<5	5	22.7	71	17.9	5.11	.08
5-	9	40.9	90	22.7		
10+	8	36.4	236	59.4		
Current marital status:						
Married	9	40.9	112	28.2	1.84	.20
Unmarried	13	59.1	285	71.8		
Have children:						
No	4	30.8	29	9.4	Fisher	.03*
Yes	9	69.2	278	90.6		
Gravidity:						
0	4	30.8	23	7.5	13.36	.001*
1	4	30.8	41	13.4		
2+	5	38.5	243	79.2		
History of abortion:						
No	5	55.6	203	71.5	Fisher	.29
Yes	4	44.4	81	28.5		

(*) Statistically significant at $p < .05$.**Table 3.** Relation between pain due to low back pain (LBP) among nurses and their illness characteristics

	Pain score (max=10)			Kruskal Wallis Test	p-value
	Mean	SD	Median		
Duration of LBP (years)					
<2	5.16	1.62	5.00	19.33	< .001*
2-4	5.68	1.86	5.00		
5-9	6.25	1.66	5.00		
10+	6.27	1.99	7.50		
LBP related to position					
No	5.51	1.74	5.00	1.02	.31
Yes	5.87	1.85	5.00		
Aggravating factors					
No	6.08	1.97	7.50	1.28	.26
Yes	5.81	1.82	7.50		
Alleviating factors					
No	5.76	3.38	5.00	1.06	.30
Yes	5.93	3.39	5.00		
LBP affects work relations					
No	5.65	1.86	5.00	6.94	.008*
Yes	6.15	1.78	5.00		
LBP affects nursing work					
No	5.60	1.92	5.00	8.82	.003*
Yes	6.14	1.69	5.00		
Treatment used					
No	5.40	2.07	5.00	4.83	.03*
Yes	5.92	1.79	5.00		
Type of treatments used					
Analgesics	6.14	1.73	5.00	5.24	.07
Rest	5.70	1.72	5.00		
Medications	6.25	2.73	6.25		
Used special therapies					
No	5.48	1.81	5.00	9.61	.002*
Yes	6.09	1.82	5.00		
Types of therapies used					
Physiotherapy	6.12	1.72	5.00	3.02	.22
Physical exercise	5.36	2.13	5.00		
Weight loss	6.11	1.54	6.25		

(*) Statistically significant at $p < .05$.

Table 4. Relation between pain due to low back pain (LBP) among nurses and their perception of pain and anxiety

	Pain score (max = 10)			Kruskal Wallis Test	p-value
	Mean	SD	Median		
Feelings of loss:					
High	6.68	1.73	7.50	21.86	< .001*
Low	5.60	1.80	5.00		
Feelings of threats:					
High	6.81	1.67	7.50	4.79	.03*
Low	5.79	1.84	5.00		
Feelings of blaming others:					
High	6.02	1.84	5.00	0.25	.62
Low	5.83	1.84	5.00		
Feelings of self-blame:					
High	5.89	1.52	5.00	0.01	.91
Low	5.83	1.88	5.00		
Spiritual feelings:					
High	6.32	1.87	6.25	2.22	.14
Low	5.79	1.83	5.00		
Total perception:					
High	6.04	1.73	5.00	0.12	.73
Low	5.82	1.85	5.00		
Anxiety:					
High	6.63	1.77	7.50	12.12	< .001*
Low	5.70	1.82	5.00		

(*) Statistically significant at $p < .05$.

As indicated in Table 5, no statistically significant relationships were found between pain and use of any types of coping measured.

Table 6 indicates positive correlation between pain score with age, BMI, experience, number of children, gravidity, number of abortion and duration of low back pain among nurses.

While negative correlation pain score with educational degree. Concerning coping strategies, it was found a positive correlation between use of effective coping mechanism with age, number of children, gravidity, and a positive correlation between coping by withdrawal with age and experience. Also it was noticed that a positive correlation between coping by denial with age and experience.

Table 5. Relation between pain due to low back pain (LBP) among nurses and their coping

	Pain score (max=10)			Kruskal Wallis Test	p-value
	Mean	SD	Median		
Use of effective coping mechanism:					
High	6.12	1.80	5.00	1.74	.19
Low	5.77	1.85	5.00		
Use of avoidant coping:					
High	6.32	1.41	6.25	2.61	.11
Low	5.79	1.87	5.00		
Use of alleviating(less intense) coping:					
High	5.93	2.00	5.00	0.19	.67
Low	5.82	1.82	5.00		
Predominant coping used:					
None	5.77	1.84	5.00	1.36	.72
Positive	6.01	1.81	5.00		
Avoidant	5.78	1.69	5.00		
Alleviating	5.74	1.97	5.00		

(*) Statistically significant at $p < .05$.

Table 6. Correlation between nurses' pain, perception, coping and anxiety scores and their personal characteristics

	Spearman's rank correlation coefficient							
	Age	BMI	Educational degree	Experience	No. of Children	Gravidity	No. of Abortions	LBP Duration
Pain score	.227**	.145**	-0.09	.237**	.192**	.205**	0.10	.177**
Perception:								
Loss	0.08	0.06	0.00	0.09	.112*	.121*	0.07	0.07
Risk	.124*	.173**	-0.07	.114*	0.06	0.06	0.04	0.03
Blame others	-0.02	0.01	-0.05	-0.04	-0.06	-0.06	-0.05	-0.07
Self-blame	0.09	0.08	-.165**	0.08	0.01	0.00	0.04	-0.01
Spiritual	.126**	.131**	-.130**	.137**	.123*	0.09	0.00	0.08
Coping:								
Use of effective coping mechanism	.117*	0.06	-0.04	0.08	.157**	.123*	0.04	0.07
Withdrawal	.152**	0.06	-0.09	.147**	0.09	0.04	0.01	-0.01
Denial	.188**	0.10	-.105*	.174**	0.04	0.04	0.04	0.06
Anxiety	-0.03	.110*	-0.01	0.00	0.00	0.00	-0.03	-0.05

(*) Statistically significant at $p < .05$; (**) Statistically significant at $p < .01$.

4. DISCUSSION

Nursing is a high-risk profession for the development of low back pain. In this study, low back pain was closely related to age (p value .04). These results are similar to the findings of the study among hospital employees at Tshwane Hospital in South Africa reported a higher prevalence of low back pain in those aged 26 to 40 years, as compared to other age groups.^[32] This is in agreement with data from the National Institute of Arthritis and Musculoskeletal and Skin Diseases^[33] report indicating that the first episode of LBP can be expected between the ages of 30 and 40 years.

Other socio-demographic characteristics of nurses in the present study revealed that increased severity of low back pain in married nurse. As regards education degree, the results of the present study have shown a higher workload and higher prevalence of LBP in nurses with hospital diploma-level education compared to those with the higher their educational status as perhaps they delegate more physical care to others. Similarly, Balague *et al.*^[34] reported higher workloads and higher prevalence of LBP in nursing aides compared with licensed nurses.

According to the present study findings, there are many causes affecting condition of the nurse, the physical attributes of the work environment and patient care. The present study revealed that causes of LBP, such as standing for long periods of time, sitting posture or continuous sitting for more than one hour increasing intradiscal pressure, heavy lifting things. These findings are in accordance with many studies (National Institute of Arthritis and Musculoskeletal and Skin Diseases, Schlossmacher and Amaral, 2012, Warnakulasuriya *et al.*, 2012, Karahan *et al.*, 2009)^[20,33,35,36] who have agreed that activities such as lifting heavy patients, repetitive lifting and

lifting alone contribute to LBP. The reasons why nurses tend to injure their backs during transfers include loss of balance (nurse and/or patient), failure to use a transfer device, sudden movement, and a poor physical work environment. In addition, lack of exercise is an important associated risk factor of LBP among nurses. Lack of exercise produces inadequate flexibility and weak muscles in the back, pelvis, and thighs, causing an increase of LBP.

The present study revealed that a positive correlation between age, BMI, experience, number of children, gravidity, number of abortion and duration of low back pain among nurses with score pain. These factors were found to have statistically significant relationships with LBP in our study. These results are in agreements with the findings of Heutink *et al.*^[20,32,33,37] who noted a similar association between age, obesity, experience and low back pain. Furthermore, Schlossmacher and Amaral^[35] reported that low back pain was 2.39 more common in obese individuals when compared with the respondents of normal weight and underweight. The findings of the present study revealed that a statically significance between LBP affects nursing work and pain score. These results are congruent with Schlossmacher *et al.*^[20,32,35,38-40] who indicated that more than two-thirds the nurses injuries were associated with the work load, work pressure and a poor environment at work were chosen by participants as being the most relevant factors that contribute to LBP.

Concerning coping strategies the present study revealed that positive correlation between pain perception and age, number of children and gravidity of the study sample these in the same line with Büssing & Büssing^[41,42] who reported that most patients with chronic diseases use adaptive coping strategies which can be differentiated according to the uti-

lization of external resources of health control. Furthermore, Ramirez-Maestr *et al.* & Brown 1987^[43,44] reported that active coping (problem solving, including collecting information and refocusing on the problem, or regulation of emotion by focusing attention on the emotional response aroused by the stressor) is associated with less pain, less depression, less functional impairment, and higher general self-efficacy.

Regarding the correlation between pain perception and anxiety, the present study revealed that anxiety as a clinical stat had a significant correlation with pain perception. This is correlated with reports by Brown^[44] reveals that one of the most frequently used concept on adaptation strategies of patients with chronic pain diseases differentiates active and passive coping, while passive coping (avoidance and escape is correlated with reports of greater depression, greater pain and flare-up activity, greater functional impairment, and lower general self-efficacy.

Further studies are required, particularly longitudinal studies to measure changes in the weighting of adaptive coping strategies and interpretations of disease with respect to pain

intensity, and comprehensive intervention programs.

5. CONCLUSION

Low back pain is common among nurses in Port-Said. More than three quarters of nurses were suffering from low back pain due to long standing and more than two third of nurses were suffering from low back pain due to heavy lifting and hospital work. With respect to strategies for coping with low back pain, positive correlations were found between withdrawal and denial as a coping strategy with age and experience.

ACKNOWLEDGEMENTS

The authors would like to express my deepest appreciation and sincere gratitude to everyone who has contributed to this work. In particular The authors would like to thank all the nurses guidance and constant support throughout this study. Without you, this study would not have been accomplished.

CONFLICTS OF INTEREST DISCLOSURE

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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