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Low back pain among nurses: Effect of psychological and occupational factors

[1]Hamid Sharif Nia, [2]Yiong Huak Chan, [3]Soheyla Kalantari, [4]Mitra Hekmat Afshar, [5]Behzad Taghipour, [6]Hoda Kaveh, [7]Ali Akbar Haghdoost

[1]*Ph.D Student Of Nursing. Faculty of Nursing and Midwifery of Amol. Mazandaran University Of Medical Sciences,Sari, Iran.*
[2]*Ph.D Of Mathematics, Head, Biostatistics Unit, Yong Loo Lin School Of Medicine, Singapore.*
[3]*Ms.C Nursing Education, Golestan University Of Medical Science, Gorgan, Iran.*
[4]*Candidate Of Phd Of Nursing, Shahid Beheshti University Of Medical Sciences, Nursing And Midwifery School, Tehran, Iran*
[5]*BsC, Student Research Committee, Mazandaran University Of Medical Sciences, Sari, Iran.*
[7]*Ph.D of Epidemiology, Professor Of Research Center For Modeling In Health, Kerman University Of Medical Sciences, Kerman, Iran.*

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ABSTRACT

Low back pain hazards have a very great impact on nurses' quality of work and life; burdening the social and economical systems. In this study, the prevalence of low back of nurses in Amol was investigated and to study the impact of the physical and psychological factors on this condition. A cross-sectional study of 400 nurses sampled by census from the Amol hospitals. The modified Nordic questionnaire was administered. The prevalence of low back pain of the Amol nurses was 81% (95% CI 77% - 85%). Univaraite risk predictors include female gender and not exercising, with occupational hazards being lifting more than 5kg of weight, bending over to pick up objects from the floor and standing in the section longer than 2 hours; psychological factors of not being satisfied with colleagues, patient companions, supervisor, nursing occupation & doing jobs for patients; cannot tolerate people & no sense of insecurity. Upon multivariate analysis, only gender, not exercising and bending over to pick up objects from the floor were significant. Performing an exploratory stepwise logistic regression yielded the following predictors: not exercising, bending over to pick up objects from the floor, walking in section less than 2 hours and not satisfied doing jobs for patients. The findings showed that the prevalence of low pain back is rampant for the nurses in Amol being influenced by the various occupational & psychological factors. Interventional programs should be implemented to alleviate this problem.

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INTRODUCTION

High prevalence of low back pain(LBP) is important health problems in the modern world despite extensive efforts in primary prevention in different countries as LBP is a very common complaint with as many as 75-85% of all people (blum_flower C *et al* 2013, croft P *et al* 2001, norregaard rasumssen CD *et al* 2013, walker B 2000). Work-related low back pain is a common work-related musculoskeletal disorder. In Western countries, LBP is one of the largest single reasons for absence from work (park JH *et al*, 2013). Back pain is a major concern in the communities because have negative impact on daily life and occupational and as well as financial cost and endangerment mental or physical health. In industrialized countries, most common complaint of pain is low back pain and headaches later (karahan A and bayraktar N, 2004). During the second half of 1980 Number of working days lost due to back pain has increased 69 percent in Great Britain and by the end of this decade 13% of working days had been lost due to back pain (mofett JAK *et al*, 1993). This disorder is the second ranked cause of lost days at work, and approximately $50 billion per year is spent on LBP in the US(shemshaki HR and amin nourian SM, 2013). Seem to the Jobs that have a lot of manually activities Such as nursing that are at high risk for back pain so that 12-month prevalence of low back pain have been reported between 66-76 percent and a point prevalence of 40-59 percent in nurses (Miitchell T *et al*, 2008). It is estimated that each year 12% of nurses leave their jobs due to back pain (gropelli T and corle K, 2010). Tinubu *et al* reported Musculoskeletal disorders represent a significant occupational problem among nurses (Tinubu BM *et al*, 2010).

The etiology of musculoskeletal disorders is complex, with physical and psychosocial working conditions playing an important role (bugajska *et al*, 2013). Several epidemiological studies show that Nurses' personal characteristics such as age, sex, BMI, smoking can be a predictor for low back pain disorders (loruss A *et al*,

Corresponding Author: Soheyla Kalantari, Msc nursing education, golestan University of Medical Science, gorgan, Iran.
E-mail: Sa.kalantary@yahoo.com

2004). Physical factors such as bending And numerous wreathe, repetitious bending forward, standing at long time and lifting heavy objects Due to the imbalance of the body and the pressure on the lumbar can have a role in causing back pain (yip Y, 2004).

Psychosocial factors such as high demand and high working pressure, poor control and defect in occupational and social systems support, satisfaction of nursing, communication between colleagues and irritable may play an important role in increasing the risk of musculoskeletal disorders (loruss A *et al*, 2004 and feye A and Herbison P, 2000). Also Chung *et al* reported incorrect work-related posture/ movement, psychological issues and the rolling shift system may be the major causes of MSDs among nurses in Taiwan. Therefore, nursing health support is necessary because they should provide adequate services to patients (chang Y *et al*, 2013).

However, these issues will be imposing economic burden, occupational and problem in personal life and also problems quality of care in health systems. On the other hand there are very few studies in Iran that focus on the separately and or simultaneously communications for the responsibility and Job Duties and stressful situations in the nursing profession and determine the role of these factors, so that Most of the results from other countries. Therefore, the present study was conducted to identify Impact of psychological and occupational factors in low back pain in nurses in Amol, Thereby Effective step to take with preventive action and modify some of these factors In order to improve the health of this group and reduce costs.

Methods:

Back Pain is any pain in the spinal cord (Edges between the lower rib and the gluteal) with or without radiation to the legs at least once in the past 12 months (Regardless, menstrual pain, pain in the genital and urinary system, surgical, cancer and cardiovascular disorders) (marena C *et al*, 1997).

In this cross-sectional survey were studies 438 nurses in three hospitals in Amol (Amol, city in Mazandaran province, the north of Iran has the population of 500000 individuals) by census methods in 2012. Of the total samples, 38 nurses had not examined due to sick leave, pregnancy and lack of consent to participate in the study. To 400 nurses who participated in this study with personal satisfaction was given Questionnaire.

Exclusion Criteria: History of back surgery, scoliosis, vertebral fractures, pregnancy, osteoporosis, multiple sclerosis, lumbar tumor, cancer, cardiovascular diseases, and menstrual.

This questionnaire was a modified Nordic questionnaire and Yip's study (yip Y, 2004) and had four parts. The first part included questions about demographic characteristics, the second section had 17 questions related to physical factors of occupational which was measured to determine the average number of work per shift, the third section includes 6 questions related to psychosocial factors in the nursing profession that was adjusted the spectrum of highly satisfied to highly dissatisfied (bigos S *et al* , 1991) and Finally, the fourth section includes 8 questions related to the psychological stress of work and nursing work environment which Was determined Scale ranging from never to always (smedly J, 1995).

Validity of the questionnaire was determined by content validity and reliability using internal consistency, Cronbach's alpha calculation (r=0.89) and also test-retest method (r=0.81). For Ethical approvals to Participants will be given ensure their information kept private.

Statistics:

Analyses were performed using SPSS 21.0. The predictors for low back pain were determined using univariate and multivariate logistic regression. An exploratory stepwise logistic regression was also performed. Statistical significance was set at $p < 0.05$.

Results:

Of the 400 nurses sampled, 78.5% were females, mean (sd) age of 32.4 (6.2), range 21 to 54 years old. 67.5% are married and 40.8% had an over-weight BMI. The results of the univariate and multivariate analyses for the demographical, physical factors, psychosocial and psychological stress are shown in Tables 1 to 4 respectively. In the multivariate analysis, all four domains were performed in one model, the tables were shown separately for reading clarity. Univariate analyses showed that the risk predictors for low back pain were female gender, not exercising, lifting more than 5kg of weight, bending over to pick up objects from the floor, standing in the section $\geq$ 2 hours, not satisfied with colleagues, patient companions, supervisor, nursing occupation & doing jobs for patients; cannot tolerate people & no sense of insecurity. Upon multivariate analysis, only gender, not exercising and bending over to pick up objects from the floor were significant. Performing an exploratory stepwise logistic regression yielded the following predictors : not exercising ($p = 0.004$, OR = 2.3, 95% CI 1.3 – 3.8), bending over to pick up objects from the floor ($p = 0.019$, OR = 1.05, 95% CI 1.01 – 1.10), standing in section > 2 hours ($p = 0.032$, OR = 2.2, 95% CI 1.1 – 4.7) and not satisfied doing jobs for patients ($p = 0.004$, OR = 6.5, 95% CI 1.8 – 23.5).

Discussion:

In this study, the majority of nurses (81%) had experienced back pain during the past year Which Was close to Corona's study (2005) (corona G *et al*, 2005). Differences in prevalence of back pain with other studies (Battevi N *et al*, 2006) May be due to differences in the definition of back pain, occupational factors, population evaluated, method measured or the average age and experience of pain. However, compared with the general population (abdolah zadeh S and jafari M, 2005) Prevalence of low back pain in nurses is very high and the like other studies, we can conclude which are nurses of group at high risk of having low back pain (loruss A *et al*, 2004 and yip Y, 2004). Also, some of the individual factors have been identified as risk factors for back pain Some other studies have confirmed the relationship them with back pain, As can be noted the female (marena C *et al*, 1997, bot S, 2007, giannandrea F *et al*, 2004), exercise (smedly J, 1995), Height (alexopoulose EC *et al*, 2003) and weight (altinle L *et al*, 2008).

The effect of exercise on pain, the results show Regular exercise reduces the risk of experiencing low back pain. People who exercise regularly have occurs lower back pain less. Daily exercise helps to maintain and strong back muscles so that it can be adapted with sudden force and thus decreases the frequency and severity of low back pain against abnormal forces (surgeons A, 2002). In social studies, tall people are more at risk for low back pain that for every 10 cm increase in length is obtained OR=1.20 (Burdorf A and Scorock G, 1997). In other conducted Studies Not find a significant relationship between weight, height and BMI with back pain (yip Y *et al*, 2001). These differences may be due to weight ranges and height ranges or different ranges defined. Also no significant relationship between LBP and level of education has been shown in other studies(levy B and Wegman D, 2000).

Results showed there was a significant relationship between gender and risk of low back pain So that the prevalence was higher in women than men. Mohseni Bandpei *et al* in their study stated that prevalence of back pain was higher in women than men (Feye A and herbison P, 2000). Results of Lorusso *et al* (2004) showed that Gender can be among the most important risk factors for back pain that increases the chances of it in women (loruss A *et al*, 2004). In the similar article, back pain has been reported in women (17, 19). Although there is research that make it negates the study results Feye *et al* (2000) showed that there is no significant relationship between gender and risk of back pain (Feye A and herbison P, 2000). It is noteworthy that most of the research in this study were female.

Among the physical factors, “move equipment weighing more than 5 kg” and “Bending over to pick up objects from the floor” were identified as risk factors for low back pain in occupational physical. Several other studies have found similar results (karahan A and bayraktar N, 2004, Yip Y, 2004). Prevalence of back pain increases with the number of hours of physical activity and repeated bending and twisting of the lumbar. Mohseni Bandpey (2007) in his study stated that the most common predisposing factor for pain is long time of standing (mohseni bandpey M *et al*, 2006). Yip (2004) Writes “Lifting and transferring patients without the aids is main factors causing low back pain in nurses”. In explaining this fact can be said: Multiple bending to pick up objects from the floor to create additional pressure on the inter-vertebral discs which Increases the risk of LBP (Yip Y, 2004). It seems, Ergonomic assessments are necessary to reduce or change the position in the bending procedure.

The results of this study showed a significant association between psychosocial and Occupation factors with Incidence of back pain. The Johnston study’s results showed that there is a relationship between psychosocial factors at work and back pain (johnston J *et al*, 2003). Also in other studies have been shown the relationship between the Incidence of back pain and psychosocial factors (corona G *et al*, 2005, corona G *et al*, 2004). Johnston said about it “Many reviews have shown the relationship between psychosocial factors and musculoskeletal disorders. Psychosocial aspects of jobs could have an important role in the persistence of back pain (Johansson A *et al*, 2007). On the other hand Yip (2004) didn’t express any relationship between back pain and psychological stress job (Yip Y, 2004). Verbeek (1999) did not show a significant relationship between back pain and psychosocial factors (Verbeek J and van der beek, 1999). Perhaps the difference of this results with our study because units have been studied in the research was office workers whereas our study is comprised of nurses. It is worth mentioning the degree and type of psychosocial stress is different in nurses and office Workers in College and also Instrument to measure workplace stress may be different in various studies. Finally, the results of this study showed there is significant relationship between psychological stress associated with the job and work environment and incidence of low back pain. Menzel adding about this issue, Psychological factors such as stress, lack of occupational support and job dissatisfaction is effective in creating occupational low back pain (Verbeek J, 2007). Smith’s study showed that Psychological pressures raises the risk of LBP 10 times (Smith D *et al*, 2004). Low back pain associated with anxiety, depression and work environment factors has been demonstrated in numerous studies (abdolah zadeh S and jafari M, 2005, Dunn K and Croft P, 2000, Haggman S *et al*, 2004).

As well as result of this study shows there are a very strong relationship between psychosocial factors associated with low back pain in Amol hospitals. The difference between the results may be due to personal

characteristics, job, Working environment and cultural characteristics samples. Since the many studies have reported high rates of job stress in nurses working and the present results confirm previous studies. It seems that back pain is a serious problem of health care in this group and several factors have an influence on back pain in nurses. Therefore, more studies are needed to understand the impact of different ways and reduce the cost of the economic system and individual to prevent back pain

Limitations of the Study:

We couldn't assess how much has happened on the back due to the progressive nature of the inter-vertebral discs.

Suggestions for further study:

Since the posterior lumbar muscle weakness is effective in creation of lumbar pain, thus it suggested that Researchers will have examined the relationship of lumbar arch, metatarsus arch and Length abdominal muscles and etc. with back pain in future studies.

Conflict of interest:

There was no conflict of interest.

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Table 1: Demographical factors on Low Back Pain

	Low back pain				Unadjusted p-value	Adjusted p-value
	No (n = 76)		Yes (n = 324)			
	n	%	n	%		
Gender					0.041	0.017
male	23	26.7%	63	73.3%		
female	53	16.9%	261	83.1%	OR = 1/8 (95% CI 1.03 – 3.2)	OR = 2.6 (95% CI 1.2 – 5.8)
BMI category					0.293	0.177
thin	3	21.4%	11	78.6%		
normal	48	21.5%	175	78.5%		
over weight	20	14.0%	123	86.0%		
obese	5	25.0%	15	75.0%		
Married					0.639	0.731
no	25	21.9%	89	78.1%		
yes	48	17.8%	222	82.2%		
widowed or divorced	3	18.8%	13	81.3%		
Exercise					0.001	0.028
No	44	15.0%	250	85.0%	OR = 2.5 (95%CI 1.5 – 4.2)	OR = 2.0 (95% CI 1.08 – 3.8)
yes	32	30.2%	74	69.8%		
	Mean	sd	Mean	sd		
age	31.7	5.8	32.6	6.3	0.295	0.099
Overtime work	29.2	39.5	33.8	39.8	0.362	0.209

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Table 2: Physical Factors on Low Back Pain

	Low back pain				Unadjusted p-value	Adjusted p-value
	No (n = 76)		Yes (n = 324)			
	Mean	sd	Mean	sd		
Physical Factors (average number of staff)						
Help the patient to sit down on the bed	3.2	4.4	3.8	5.6	0.397	0.640
Helping the patient to stand	2.0	3.1	2.5	3.8	0.290	0.380
Helping the patient to walking or moving	1.5	2.8	1.9	3.3	0.364	0.792
Move the patient between bed and stretcher	2.7	4.7	3.1	4.8	0.468	0.542
Move the patient between bed and chair	2.1	3.0	2.0	2.9	0.629	0.051
Help the patient to go to the toilet	.8	1.9	1.1	2.7	0.479	0.252
Help the patient to go to the bathroom	1.0	1.9	1.2	2.6	0.504	0.773
Displacing the Section Tools	5.5	5.1	6.2	6.7	0.416	0.523
Relocating of the bed	2.0	3.3	2.4	4.2	0.448	0.737
Relocating of the patients in the bed	3.7	4.2	4.3	5.8	0.394	0.882
Lifting more than 30 kg weight	1.7	3.1	2.2	4.3	0.303	0.710
Lifting more than 5 kg weight	4.3	5.4	6.2	7.7	0.04 OR = 1.05 (95% CI 1.01 – 1.10)	0.700
Move the Tralee in the part	4.5	4.7	5.6	6.9	0.190	0.574
Bending over to pick up objects from the floor	6.4	5.2	9.3	9.3	0.005 OR = 1.06 (95% CI 1.02-1.11)	0.047 OR = 1.06 (95% CI 1.01 – 1.13)
Bending at the edge of the bed to do the procedure	8.6	8.2	8.1	7.9	0.651	0.151
Change the patient's position in the bed	4.5	5.4	4.6	5.1	0.916	0.252
Raise hands above the shoulder	9.3	9.6	9.3	8.0	0.977	0.829
Physical Factors (≥ 2 hours)	n	%	n	%		
Walking in the section					0.569	0.100
< 2 hours	61	18.5%	269	81.5%		
≥ 2 hours	15	21.4%	55	78.6%		
Sitting in section					0.035	0.349
< 2 hours	16	29.6%	38	70.4%		
≥ 2 hours	60	17.3%	286	82.7%	OR = 2.0 (95% CI 1.05 – 3.8)	
Standing on section					0.169	0.679
< 2 hours	17	25.0%	51	75.0%		
≥ 2 hours	59	17.8%	273	82.2%		

Table 3: Psychosocial factors on Low Back Pain

	Low back pain				Unadjusted p-value	Adjusted p-value
	No (n = 76)		Yes (n = 324)			
	n	%	n	%		
Psychosocial						
Relationships with colleagues					0.001	*
Satisfied	76	21.3%	280	78.7%		
Not satisfied	0	0.0%	44	100.0%	OR = 1.27 (95% CI 1.20 – 1.34)	
Relationships with the patient companions					0.042	0.248
Satisfied	67	21.1%	251	78.9%		
Not satisfied	9	11.0%	73	89.0%	OR = 2.2 (95% CI 1.03 – 4.6)	
Relationships with supervisor					0.011	0.316
Satisfied	71	21.4%	261	78.6%		
Not satisfied	5	7.4%	63	92.6%	OR = 3.4 (95% CI 1.3 – 8.8)	
Satisfaction of the workplace					0.075	0.704
Satisfied	57	21.5%	208	78.5%		
Not satisfied	19	14.1%	116	85.9%		
Satisfaction of nursing occupation					0.033	0.271
Satisfied	63	21.6%	229	78.4%		
Not satisfied	13	12.0%	95	88.0%	OR = 2.0 (95% CI 1.06 – 3.8)	
Satisfaction of doing jobs for patient					0.005	0.148
Satisfied	73	21.6%	265	78.4%		
Not satisfied	3	4.8%	59	95.2%	OR = 5.4 (95% CI 1.7 – 17.8)	

* not included in multivariate model as there were a 100% response which will cause the model to be unstable.

Table 4: Psychological Stress factors on Low Back Pain

	Low back pain				Unadjusted p-value	Adjusted p-value
	No (n = 76)		Yes (n = 324)			
	n	%	n	%		
Psychological stress						
Headache at work					0.214	0.079
No	4	11.1%	32	88.9%		
Yes	72	19.8%	292	80.2%		
Fatigue of too much work					0.393	0.785
No	9	15.0%	51	85.0%		
Yes	67	19.7%	273	80.3%		
Low mood					0.268	0.567
No	2	9.5%	19	90.5%		
Yes	74	19.5%	305	80.5%		
Pressure in head					0.723	0.186
No	12	20.7%	46	79.3%		
Yes	64	18.7%	278	81.3%		
Anxiety at work					0.834	0.155
No	6	17.6%	28	82.4%		
Yes	70	19.1%	296	80.9%		
Hastiness at work					0.051	0.054
No	1	3.3%	29	96.7%		
Yes	75	20.3%	295	79.7%		
Intolerance of people					0.003	*
No	0	0.0%	35	100.0%	OR = 1.26 (95% CI 1.20 – 1.33)	
Yes	76	20.8%	289	79.2%		
Sense of insecurity					0.009	0.272
No	4	6.3%	59	93.7%	OR = 4.0 (95% CI 1.4 – 11.4)	
Yes	72	21.4%	265	78.6%		

* not included in multivariate model as there were a 100% response which will cause the model to be unstable.

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