The prevalence of low back pain among nurses working in Poursina hospital in Rasht, Iran

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Abstract
Objective: Low back pain is the most common skeletal disorder worldwide that 50%
to 80% of people experience it at least once in their lifetime. Physical and psychological
factors in the work environment can relatively contribute to low back pain. In this study,
we examined the prevalence of low back pain and influential factors in its development
among nursing staff.
Methods: In this cross-sectional study we assessed the prevalence of low back pain among
nurses working in Poursina hospital, Rasht, Iran, during March and April 2012. Demographic
data and information on the status of skeletal pain, as well as, associated factors were
collected using a pre-designed check list. Data were analyzed using SPSS version 16.
Results: A total of 350 nurses with a mean age of 32.00 ± 8.24 years (minimum 22 and
maximum 56 years) were studied (90.3% female). 246 participants (70.3%) had a history of
low back pain. There was no significant difference between gender and the incidence of
low back pain, ($P = 0.286$). 96 participants (27.4%) aged 27 to 31 had the highest rate of low
back pain and 11 participants (3.1%) aged 52 to 56 were the least frequent age group. Low
back pain significantly differed by age ($P = 0.001$), body mass index (BMI) ($P = 0.222$), and
physical activity ($P = 0.050$).
Conclusion: The results of this study showed a prevalence of 70% for low back pain among
nurses working in Poursina hospital in Rasht, in Gilan province. Age, BMI, and physical
activity were significantly associated with the prevalence of low back pain. However,
gender, occupation, marital status, smoking, family history, frequency of lifting heavy
things, work experience, and workplace did not show a significant relationship.
Keywords: Low back pain, Nurses, Prevalence, Risk factors

Introduction

Low back pain as the most common skeletal disorder
worldwide is experienced by 50% to 80% of people at least
once in their lifetime (1,2). In addition to upper respiratory system diseases and headache, low back pain is the third
leading cause of physicians' visits (3). Although many factors are involved in causing low back pain, but some jobs
can increase the risk. In other words, physical and psychological factors in the work environment can somehow play
a role in causing low back pain (4). In jobs such as nursing,
driving, and laboring, due to frequent changes in posture,
lifting heavy loads and bending, the prevalence of low
back pain is more than other jobs (3,5). Low back pain is
identified as one of the most common complaints in nurses with an estimation of 38%-67% in the American nurses, 73%-76% in German nurses, and 9.38% in nurses in
Hong Kong (6-10). Low back pain can cause occupational
disabilities, increased cost of care and treatment, loss of
productivity, and absence from work (3,11). Gender is an

influential factor in this area, however, the impact of factors such as age, duration of activity and smoking cannot
be disregarded (12-15). Although the cause of low back
pain can be detected through patient complaints, clinical
examinations, laboratory tests and medical imaging, but
the main reason behind it is somewhat difficult to detect.
Therefore to reduce the incidence of back pain, risk factors should be identified and preventive policies should
be considered. This is significantly important not only for
the treatment and medical costs that this incidence place
on the health care system but also due to the critical role of
nurses in public health. Thus, in this study, we examined
the prevalence of low back pain and influential factors in
its development among nursing staff in 2012.

Methods

This was a cross-sectional study to assess the prevalence
of low back pain among nurses working in Poursina hospital, Gilan, Iran, during March and April 2012. Based

on the census method of data collection, all nursing staff including nurses, licensed nursing assistants, and nursing assistants entered the study. Demographic data and information about work experience, a history of low back pain, body mass index, marital status, workplace, and treatments performed (medication, physiotherapy, bed rest), history of physical exercise, smoking history, family history of low back pain, history of musculoskeletal disorders, parity, number of children, duration of time devoted to doing housework, frequency of patient relocation on a stretcher and vice versa, the frequency of lifting objects weighing more than 3 kg, and depression were completed using a pre-designed checklist. Individuals with known congenital skeletal abnormalities were excluded from the study. To complete a more accurate list, in coordination with the hospital director, nursing services manager, and training supervisor, more detailed nurses' information were extracted. Finally, collected data were analyzed using SPSS version 16 software through chi-square test. A significant level of $P < 0.05$ was considered.

Definitions
Physical activity: at least 150 minutes of physical activity per week that leads to increased heart rate.
Body mass index (BMI): A person's weight in kilograms divided by the square of height in meters. According to the value obtained, subjects are divided into 4 groups, underweight (BMI less than 18), normal (BMI between 18.5 and 24.99), overweight (BMI between 25 and 30) and, obese (BMI more than 30).

Results
A total of 350 nurses with the mean age of 32.00 ± 8.24 years (minimum 22 and maximum 56 years) were studied (90.3% female): 306 nurses (87.4%), 25 licensed nursing assistants (7.1%), and 19 nursing assistants (5.4%). A total of 246 participants (70.3%) had a history of back pain, while 104 (29.70%) had no history of low back pain. Table 1 shows background information of patients. There was no significant difference ($P = 0.286$) between gender and the incidence of low back pain. Ninety-six participants (27.4%) aged 27 to 31 had the highest rate of low back pain and 11 participants (3.1%) aged 52 to 56 were the least frequent age group. Table 2 shows the frequency of low back pain according to sex, age, BMI, physical activity, smoking, family history, frequency of lifting heavy things, work experience, and workplace. A significant difference was observed between age and the history of low back pain ($P < 0.001$). The mean BMI was 24.10 ± 4.74 (minimum 16.5 and maximum 66). The highest rates of low back pain were seen in people with a BMI of 19-24.99 (49.2%) and the lowest in individuals with a BMI of less than 18.5 (4.5%). There was no significant difference between the history of low back pain and physical exercise ($P = 0.050$). Treatment method included bed rest (34.1%), combination therapy (30.9%), use of medication (22%),

Table 1. Background information of the participants

Information	Female (%)	Male (%)
Gender	316 (90.3)	34 (9.7)
Occupation		
Nurse	289 (94.4)	17 (5.6)
Licensed nursing assistant	17 (68)	8 (32)
Nursing assistant	10 (52.6)	9 (47.4)
Physical activity		
Positive	122 (87.1)	18 (12.9)
Negative	194 (92.4)	16 (6.7)
No. of children		
0	166 (98.2)	3 (1.8)
1	80 (87)	12 (13)
2	52 (77.6)	15 (22.4)
3	13 (76.5)	4 (23.5)
4	5 (100)	0 (0)

and physiotherapy (3.7%) and 9.3% of the cases received no treatment. The mean number of lifting heavy things by nursing staff had no significant association with low back pain ($P = 0.25$). The highest frequency of pain was related to the group with less than 5 years of work experience including 120 patients (34.3%) and subjects with 20-25 years of work experience had the minimum rate, including 21 patients (6%). There was no significant relationship between work experience and a history of low back pain ($P = 0.08$). Also, no significant relationship was found between the prevalence of low back pain and workplace ($P = 0.606$).

Discussion
Results of this study showed a prevalence of 70% for low back pain among nurses working in Poursina hospital, Rasht, Gilan province. Age, BMI, and physical activity were significantly associated with the prevalence of low back pain. Yet, the relationship between gender, occupation, marital status, smoking, family history, frequency of lifting heavy things, work experience, and workplace was not significantly confirmed. Low back pain is a common problem in which 50% to 80% of people experience it during their lifetime (1,2). The prevalence of low back pain varies according to occupations. Ramazani Badr et al (16) reported a prevalence of 52.7% in nursing staff. The cumulative incidence of back pain was assessed at 57.7% and the annual incidence rate was at 1.5% in Bejia et al (17) investigation. A higher prevalence of low back pain (73%-76%) was reported in the study of Maul et al (6). This difference in prevalence in different studies may be due to differences in occupational factors, different definitions of back pain or back pain prevalence rate in different time periods (6,16,17). Heavy physical activities such as moving and lifting patients are the most important risk factors for low back pain among nurses. Most research-

Table 2. Prevalence of low back pain according to gender, age, BMI, occupation, amount of exercise, smoking, family history, frequency of lifting heavy things, work history, marital status, and workplace

Variable	Subjects with a history of back pain, No. (%)	Subjects without a history of back pain, No. (%)	P
Sex			0.286
Female	224 (91.1)	92 (88.5)	
Male	22 (8.9)	12 (11.5)	
Age group (y)			0.001
22-26	32 (13)	34 (32.7)	
27-31	66 (26.8)	30 (28.8)	
32-36	56 (22.8)	18 (16.3)	
37-41	33 (13.4)	12 (11.5)	
42-46	24 (9.8)	5 (4.8)	
47-51	25 (10.2)	5 (4.8)	
52-56	10 (4.1)	1 (1)	
BMI			0.022
<18.5	11 (4.5)	9 (8.7)	
19-24.99	121 (49.2)	61 (58.7)	
25-30	79 (32.1)	29 (27.9)	
≥30	35 (14.2)	5 (4.8)	
Occupation			0.489
Nurse	217 (88.2)	89 (85.6)	
Licensed nursing assistant	15 (6.1)	10 (9.6)	
Nursing assistant	14 (5.7)	5 (4.8)	
Marital status			0.804
Single	73 (29.7)	33 (31.7)	
Married	170 (96.1)	69 (66.3)	
Widow/widower	3 (1.2)	2 (1.9)	
Physical activity			0.05
Yes	91 (37)	49 (47.1)	
No	15 (63)	55 (52.9)	
Smoking			0.187
Yes	4 (1.6)	4 (3.8)	
No	242 (98.4)	100 (96.2)	
A history of low back pain, according to family history			0.23
Yes	144 (58.5)	66 (63.5)	
No	102 (41.5)	38 (36.5)	
The frequency of lifting heavy things			0.25
Very high (6 times or more per shift)	95 (38.6)	26 (25)	
High (4-5 times per shift)	62 (25.2)	24 (23.1)	
Moderate (2-3 times per shift)	36 (14.6)	18 (17.3)	
Low (0 to 1 time per shift)	53 (21.5)	36 (34.6)	
Working experience (year)			0.08
5<	69 (28)	51 (49)	
5-10	73 (29.7)	24 (23.1)	
10-15	40 (16.3)	11 (10.6)	
15-20	30 (12.2)	11 (10.6)	
20-25	16 (6.5)	4 (3.8)	
> 25	18 (7.3)	3 (2.9)	
Work place			0.606
Emergency department 1	22 (8.9)	8 (7.7)	
Emergency department 2	20 (8.1)	10 (9.6)	
Surgery department (men)	10 (4.1)	8 (7.7)	
Surgery department (women)	11 (4.5)	6 (5.8)	
Orthopedic department (men)	25 (10.2)	6 (5.8)	
Orthopedic department(women)	12 (4.9)	7 (6.7)	
Surgery room	30 (12.2)	15 (14.4)	
Intensive Care Unit	37 (15.0)	12 (11.5)	
Clinic	22 (8.9)	15 (14.4)	
Neurology department	22 (8.9)	6 (5.8)	
Nursing Office	10 (4.1)	3 (2.9)	
Neurosurgery department	25 (10.2)	8 (7.7)	

ers believe that physical factors only partially explain the high prevalence of low back pain, and psychosocial factors in the work environment cannot be ignored (16). This study was performed on 350 nurses; a high percentage of them were female unlike Bejia et al (17) investigation that more subjects were male. This can be related to this fact that women constitute a large portion of the nursing profession in Iran. There was not a significant relationship between gender and back pain. This finding is similar to the study of Yip (7). Several studies have also found that gender cannot increase the risk of low back pain (18-21). Nearly 50% of the nursing staff performed an exercise that led to no significant result. Regular physical activities, due to strengthening the back muscles, reduce the chances of low back pain. But there are studies that acknowledge the ineffectiveness of exercise in reducing the incidence of low back pain (18,22,23). A significant correlation was found between smoking and the incidence of low back pain. Although the poor consequence of smoking is known in the incidence of low back pain, but the results of some studies indicate the effect of smoking on the risk of low back pain (7). There was a significant relationship between BMI and history of low back pain. This was consistent with the results of another study on the effect of BMI in low back pain (24). 48.3% of patients had no child, and 26.3% had only 1 child. Also, regarding the number of pregnancies, 50.9% had no history of pregnancy and 25% had 1 pregnancy. In this regard, the pregnancy or number of children had no significant relationship with low back pain. Yip also found no significant relationship between low back pain and pregnancy (7). On the other hand some studies have confirmed the relationship between the number of pregnancies and deliveries with low back pain. This difference may be due to prenatal care, dissimilar physiological characteristics of women's bodies, and causes of back pain during pregnancy (25-27). Nurses' low back pain can reduce the quality of health care services and increase the dissatisfaction of patients as a result. In order to increase the level of patient satisfaction with nursing services, physical activity, diet modification, and weight loss are recommended. Also, the establishment of training classes can be somewhat effective in order to control biomechanical factors of low back pain. So, conducting studies addressing biomechanical factors involved in low back pain is recommended. In future research, determining the amount of cost due to the absence of staff and its reflection in the care of patients is suggested.

Conclusion

The results of this study showed a prevalence of 70% regarding low back pain among nurses working in Poursina hospital in Rasht in Gilan. Age, BMI, and physical activity were significantly associated with the prevalence of low back pain. In addition, no relationship between gender, occupation, marital status, smoking, family history, frequency of lifting heavy things, work experience, and workplace with back pain was found.

Ethical issues

This study was approved by the ethics committee of Gilan University of Medical Sciences. During the study, researchers also were committed to the principles of the Helsinki Declaration on the protection of patient confidentiality.

Authors' contributions

All authors met four criteria for authorship contribution based on recommendations of the International Committee of Medical Journal Editors.

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