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Chronic Low Back Pain Preventive Behaviors among Nursing Aides: A Cross-sectional Study from Qom, Iran

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Abstract

Aim: This is a cross- sectional study to assess low back pain preventive behaviors among Iranians nursing aides who provide direct patient care in hospitals.
Musculoskeletal disorders (MSDs) comprise significant occupational injuries and disabilities within the nursing profession. Studies show that implementing a safe patient handling can prevent low back pain among nursing aides.

Methods: This study was conducted in Qom (Iran) in 2015 with a sample of 452 eligible nursing aides working in six educational hospitals affiliated with Qom University of Medical Sciences. Data were collected by a researcher-developed questionnaire with 29 questions in two sections of demographic questions (17 items), and low back pain preventive behaviors were adopted from the Occupational Safety and Health Administration (OSHA) guidelines for nurses (12 items).

Findings: Totally, 452 nursing aides suffering from chronic low back pain participated in the study, which included 289 males (63.9%) and 163 females (36.6%) with mean age of 37.71 (SD = 8.3) years. The mean score of applying low back pain preventive behaviors was 32.9 ± 7.7. Fifty nine participants (13.1%) had poor behavior scores, 251 participants (55.5 %) obtained average scores, and 142 participants (31.4 %) achieved acceptable scores due to their preventive behaviors. The majority of the studied nursing aides (68.6%) did not consistently perform safe patient handling.

Conclusion: This study showed that most nursing aides had low preventive behaviors regarding maintaining their body mechanics. Thus, evaluating the causes of failing to do safe behaviors /safe patient handling is strongly recommended in Iran.

Keywords: Chronic low back pain, Preventive behaviors, Nursing aides

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Introduction

Musculoskeletal disorders (MSDs) comprise significant occupational injuries and disabilities within the nursing profession [1]. Nurses have six times higher prevalence of back trouble (pain) in comparison with other health professionals [2]. Additionally, nursing aides and orderlies suffer the highest prevalence (18.8%) and report the most cases annually (269,000) of work-related back pain among female workers in the United States. The prevalence of low back pain is higher in nurses than other occupational groups as it is reported to be about 73% to 90% [3]. An increased risk of low back pain (LBP) among nursing aides has been recognized for quite some time [4, 5]. Researchers explored some adverse effects of LBP; for example, not able to perform their job properly (44%), reduction in productivity and creativity (33%), increased work restrictions (28%), and decreased quality of patient care (26%) [2]. One research study showed that 11% of nurses quit their job because of LBP [6]. The nursing duties are also associated with elevated risk of LBP [7]. The pain frequently experienced by nurses undermines psychological health and reduces professional performance. Specifically, the act of patient handling has been recognized as a high risk activity for nurses [8].

Many of these injuries are preventable [9]. Patient handling and movement is believed to be an important causative factor since these activities require the use of force by a worker to hold, support, reposition or transfer (lift, lower, carry, push, pull or slide) a person [10]. Patient handling requires a series of physical motions and changes in posture, such as bending, twisting, and repetitive motions that cause high compressive and shear forces on the spine [8]. The researchers observed that the nurses who did not sit correctly did not support the lumbar area, and did not protect the natural curve of their lumbar region [11]. Many patient handling tasks are considered to be high-risk based on the magnitude of weight lifted, bizarre and unpredictable nature of the load lifted (patient), and sustained bizarre positions required to provide nursing care [12]. The most afflicted professionals were the nursing aides (39.1%) and orderlies (39.1%) primarily due to moving and transferring of patients and falling on slippery floors [13]. Job- related factors such as exposure to frequent lifting, working as a nursing aide, and a previous history of back injury are more important predictors of back injury in nurses than personal factors [14].

Nursing aides who complete patient care tasks, which may include: repositioning of patients to prevent pressure ulcers and promote comfort, ambulating patients to prevent blood clots and pneumonia, and transferring patients to wheelchairs and stretchers [14], are at risk for fatigue, musculoskeletal pain, and disabling injuries [15]. Factors such as the patient's

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weight, transfer distance, confined workspace, unpredictable patient behavior, and bizarre positions like stooping, bending, and reaching significantly contribute to the risks in patient care tasks [16]. The physical hazards of manual patient handling are well documented [2]. In general, 35-lb maximum weight limit recommend for use in patient-handling tasks. When weight to be lifted exceeds this limit, assistive devices should be used [17]. Staff members have many reasons for not using equipment including lack of time and availability of the equipment, difficulty of its use, space constraints, and patient preferences [5]. Protecting the health and safety of nursing personnel is vital not only to the staff members and their employers, but also to the nation's health [15]. Studies show that implementing a safe patient handling and movement program can pay for itself in a short period of time and provide long-term benefits for both the health care facilities and the nursing staff [8]. It is advisable to use the principals of proper body mechanics to keep spines healthy [18]. Many employers and nurses believe lifting injuries can be prevented by using proper body mechanics; therefore, lifting equipment is mostly warranted for obese adults [19]. Much misinformation persists about safe handling practices. Thus, the main objective of this study is surveying the LBP preventive behaviors of Iranian nursing aides who provide direct patient care in hospitals.

Methods

This descriptive cross-sectional study was conducted in Qom, Iran, in 2015 with a sample of 452 patient care providers who worked in the educational hospitals affiliated with Qom University of Medical Sciences, Qom. The Ethics Committee of Tarbiat-Modares University approved the study. All participants gave informed written consent.

The sample of 452 nursing aides was selected from different units located within six hospitals connected with Qom University of Medical Sciences. Convenience sampling was used to select the nursing aides who met the following inclusion criteria: being nursing aides with at least 1 year of experience in clinical nursing, no reported musculoskeletal disorders (MSDs), no history of surgery on skeletal muscles, and completion of an informed consent form. The sole exclusion criterion was unwillingness to participate in the study. The research environment included Emergency, Gynecology, Surgical, Internal, Angiography, ENT (Ear, Nose, and Throat), Neurosurgery and Orthopedic wards, as well as the operating rooms, CCUs, and adult and neonatal ICUs of the 6 hospitals.

Data collection was conducted in the participants' working environments. The data collection tool was a researcher-developed questionnaire with 29 questions in two sections. The first section included 17

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demographic questions on the subject's age, weight, height, sex, education, physical activity, employment status, marital status, working conditions, organizational position, CLBP characteristics, socio-economic characteristics, and work history. Work-related demographics were also included in this section. They included questions about type of work setting, usual shift schedule, average hours of patient handling and movement per month, working in another job , supplementing the main nursing job, and finally, patient handling and movement history.

The second section practice contained a checklist with 12 questions regarding LBP preventive behaviors adopted from the Occupational Safety and Health Administration (OSHA) guidelines for nurses. These items were focused on the correct steps to moving and handling patients like using of body mechanics principles in moving or lifting patients and bending on the patient or the work surface while working applying the correct posture of standing or sitting and using appropriate work management activities to reduce exposure to chronic low back pain (CLBP) risk factors. CLBP risk factors were measured on a 4-point Likert scale (never = 1, sometimes = 2, often = 3, and always = 4) that showed the frequency of these preventive behaviors in the hospital. The respondents were free to take time answering this survey under the researcher's supervision .The nurses' scores of practice regarding CLBP were categorized by an expert panel into three different levels: poor score from 12 to 24, average score from 25 to 36 and acceptable score from 37 to 48. The checklist was being tagged by the participants.

To provide content validity, an expert panel consisting of 10 specialists, including two specialist neurosurgeons, a specialist rheumatology, an epidemiologist, three nursing teachers, and three health education experts checked all the items, and inserted their recommendations into the questionnaire. After content validity was established, the questionnaire was simplified so that each participant could answer the questions easily [20]. Face validity of each question was determined by 25 nursing aides from different units in Qom hospitals through which each item was evaluated and modified based on its appearance, fit, brevity, clarity, ease of understanding, and inclusiveness.

Internal consistency of the instrument was evaluated by the Cronbach's alpha coefficient for the entire questionnaire. The Cronbach's alpha coefficient of 0.7 or above was considered satisfactory [21, 22]. In this study, the Cronbach's α coefficient showed satisfactory results with alpha= 0.9 for the entire questionnaire. In addition, we used test-retest to examine the instrument's stability by

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calculating Intra- Class Correlation Coefficient (ICC) with a sub-sample of nurses (n = 28) who completed the questionnaire twice, with an interval of 2 weeks [23]. The acceptable value for ICC, was considered 0.4 or above [23]. The ICC of the questionnaire in this study was also found satisfactory, indicating that the questionnaire had a good stability.

Several statistical analyses were performed to assess the healthy prevention behaviors among the nursing aides. All the statistical analyses were performed using the SPSS version 16.0 [24].

Results

In all, 452 nursing aides suffering from CLBP participated in the study. It included 289 males (63.9%) and 163 females (36.6%) .The mean age of the participants was 37.71 (SD = 8.3) years, and their mean work experience was 10.27 (SD = 8.1) years. The demographic characteristics of the participants are shown in the Table 1.

Table 1: Characteristics of the study sample

Demographic variables	EFA sample (n = 452) Number (Percent)	Test-retest sample (n = 28) Number (Percent)
Age (years)		
Mean (SD)	37(8.3)	38.8(8)
Total number of working (years)		
Mean (SD)	10.27(8.1)	11.8(8.7)
Gender		
Mail	289 (63.9)	22(78.6)
Female	163 (36.6)	6(21.4)
Employment status		
Official	31(7)	3(10.7)
Official Demo	16(3.5)	3(10.7)
Contractual	366(81)	20(71)
Other cases	22(4.7)	2(7)
Marital status		
Single	47(10.4)	3(10.7)
Married	391(86.5)	24(85.7)
Divorced/Widow	14(3.1)	1(3.6)
Degree in nursing		
Bachelor' degree	58(12.8)	1(3.6)
Associate's degree	14(3.1)	0(0)
Diploma degree	112(24.8)	12(42.9)
Secondary degree	113(25)	3(10.7)
Elementary degree	138(30.5)	12(42.9)
Regular exercise		
Yes	90(21%)	
No	339(79%)	
Body mass index		
Thin	22(5.9)	
Normal weight	153(41.2)	
Overweight	151(40.7)	
Obese	45(12.1)	

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According the findings of the present study, the mean score of applying LBP preventive behaviors among the nursing aides was 32.9 ± 7.7. Fifty nine participants (13.1%) had poor behavior scores, 251 participants (55.5 %) obtained average scores regarding their preventive behaviors, and 142 participants (31.4 %) achieved acceptable scores due to their preventive behaviors. In this study, the majority of the nursing aides (68.6%) did not consistently perform safe patient handling/movement, and only 2.4% of them performed safe patient handling/movement consistently.

Table 2 shows the preventive LBP behaviors of the participants based on their answers to the behavior assessment checklist. As shown, 190 studied nursing aides (42%) reported that when they were moving or transferring the patient in bed, stretcher or wheelchair, they were always quite close to the patient. However, 168 participants (37.2%) reported that they often performed this behavior, 70 participants (15.5%) stated that they sometimes complied with this behavior, and 24 participants (5.3%) never did this healthy behavior while moving/transferring the patients. The rest of LBP preventive behaviors outlined in the checklist and the responses of the studied nursing aides are shown in Table 2. The majority of the participants (31.2%) stated that they did not train to strengthen their muscles during break time or other opportunities in their workplace.

Table 2: Frequency of low back pain preventive behaviors of the studied participants

Behaviors	**Always** Number (Percent)	**Often** Number (Percent)	**Sometimes** Number (Percent)	**Never** Number (Percent)
1- I avoid back bending. Instead I maintain normal spine posture by bending the legs	94(20.8)	164(36.3)	156(34.5)	38(8.4)
2- I'm quite close to the patient.	190(42)	168(37.2)	70(15.5)	24(5.3)
3- I avoid back rotation. Instead use the legs to turn around and change the direction.	115(25.4)	164(36.3)	129(28.5)	44(9.7)
4- I first kneel on the bed and pull patient sheets or blankets.	121(26.8)	150(33.2)	116(25.7)	65(14.4)
5- When I'm pushing the stretcher, I bent forward from the hips and bent my elbow so that distance of my hands to the body is 30 to 35 cm.	115(25.4)	168(37.2)	122(27)	47(10.4)
6- I open my feet with shoulder-width apart to maintaining balance.	165(36.5)	141(31.2)	106(23.5)	40(8.8)
7- I ask for help from other colleagues while lifting heavy objects.	121(26.8)	170(37.6)	136(30.1)	25(5.5)
8- When I'm lifting or pulling patient, I use the muscles of my legs.	127(28.1)	167(36.9)	124(27.4)	34(7.5)
9- I stay in such a way that the patient's weight is evenly transferred on both my arms and legs	160(35.4)	160(35.4)	102(22.6)	30(6.6)
10- When I am pushing the stretcher, I positon in such a way that my arms are placed on either side of my body and palms facing up.	108(23.9)	178(39.4)	117(25.9)	49(10.8)
11- I avoid prolonged standing at work and if forced, I put one foot on a stool or box in a height of 20 cm and change every 10 minutes of my feet.	61(13.5)	106(23.5)	176(38.9)	109(24.1)
12- I use every opportunity to exercise the muscles of the low back, thigh and abdomen in work to strengthen these muscles to prevent injury in my spine.	47(10.4)	90(19.9)	174(38.5)	141(31.2)

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Discussion

This study examined the prevalence of LBP preventive behaviors among Iranians nursing aides. Our findings showed that the majority of the participants were not doing LBP preventive behaviors. This result is in line with a previous study done in Iran [25]. In contrast with the present study, Vaidya (2014) reported that the majority of the studied staff nurses complied with healthy body mechanics during their activities. Hereby, it may be concluded that nursing aides in Iran would be more susceptible to LBP, disability and absence from work. So, more attention should be paid to them [26].

In this study, the majority of the nursing aids did not use body mechanic techniques constantly during the working time; whereas only few respondents reported they have performed safe patient handling. This result is in contrast with the results reported by Jaafar (2015) in which about two third of the respondents complied with the healthy posture of vertebra during working time [18]. However, in Nelson' Study (2006), the nurses performed patient handling tasks about 6 times per day unsafely, which means without using any proper equipment or number of staff needed [12]. Karahan (2004) found that nurses did not use body mechanics correctly when making some movements [8]. The study added that sitting, lifting, extending, and moving the patients to the side of the bed were not done correctly by the studied nurses [8]. In the present study, the behaviors of the nursing aids were not observed, rather these behaviors were reported by the respondents that could be a kind of limitation in this study.

Although the present study showed low frequency of overall healthy behaviors for LBP prevention among the studied nursing aides, some behaviors like being quite close to the patient during patient transition were paid more attention by the nursing aides. Maybe the reason of doing this behavior that is being more close to the patients made them more accessible so that the nursing aids could take care of the patients more fluently. Furthermore, this position prevents stretching of limbs and bending forward, which consequently resulted in causing additional pressure. However, this healthy behavior among the studied nursing aids in the present study is not due to their previously training about maintaining body mechanics posture during activity.

The other more reported prevalent preventive behavior was positioning the feet with shoulder-width apart to maintain balance while transporting the patient. Since the patient falling down is dangerous and has bad consequences, the nursing aids tried to keep their balance to prevent this to happen by using this body mechanic principle that is the best

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way to maintain individual balance. This finding is supported by Karahan (2004) who showed that the majority of the nurses used proper body mechanics while carrying something heavy [6]. In our study, as mentioned above, this posture has been kept by the nursing aids involuntarily, not on previous education and training. The nursing aides displayed more frequent behavior of staying in such a way that the patient's weight evenly transferred on both arms and both legs. People involuntarily would prefer to split the weight of objects between their both hands and arms so as to suffer less damage and undergo less pressure imposed on their muscles and bones. In this way, the nursing aides could be responsible for more weight and preventing the patient from falling down. Most possibly, that is why patient carriers were more likely to be inclined in expressing such behavior in this study. However, our evidence found that moving the patient to the side of the bed was not done correctly by nearly half of the studied nurses. This research showed that about two third of the studied nurses had the right position when moving the patient to a sitting position in bed, and more than half of them brought their patients to a standing position correctly [6].

In the present study, some activities such as exercising the low back muscles and standing correctly at work or bending the back were displayed at the lowest frequency among the nursing aides. There have been situations in which the health care providers have been opposed or ridiculed by their colleagues. Many nurses, accordingly, prefer not to do exercise on such a case, especially when the hospital is crowded and the health care providers are so busy. However, different studies have shown the lower prevalence of back pain among those who exercised regularly [25]. Thus encouragement of Iranian health care providers to do proper exercise in working site is strongly recommended.

In some cases, in the present study, some health care providers were obliged to be in standing position for a long time, during which no footrests were available, and thus correct way of standing was unlikely to be correct. In a previous study, the majority of the nurses had a correct position while standing [6]. In our study, this behavior was reported by the respondents, and the authors were not assured about the authenticity of the reported behavior.

In this study, due to shortness of the hospital beds, the health care providers had to bend their wrists when working out with the patients. In these cases, they had better bend their knees rather than their wrists or they might choose to sit on a chair or bench, which may happen as a result of difficulty in bending knees. However, unavailability of seats, haste in completing tasks and adding simplicity to

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assign their jobs caused incorrect posture during the work. Previous research showed that the nurses spent about one third of their time bent forward or with the trunk twisted during the activities such as bathing, dressing and undressing patients [27]. Previous research found that the majority of the studied nurses were in a correct position when pulling or pushing [6]. The nurses who performed the pulling and pushing movements in the wrong manner held the objects by the side or rotated the upper part of their bodies [6]. According to the observations of Karahan and Bayraktar, lifting was practiced incorrectly by more than half of the nurses. However, evidence shows that balance often is not considered when nurses are taught to lift loads from below flexed knees with the back straight [27]. In the present study, the heathy behaviors regarding LBP prevention were just reported by the respondents rather than being observed by the researchers. This limitation should be considered and removed in future studies. However, the findings of this study regarding low frequency of doing LBP preventive behaviors at workplaces by health care providers are supported by other researches done in Iran. Therefore, doing more research to confirm these results and designing studies to assess the causes of these unhealthy behaviors among health care providers are strongly recommended.

Conclusion

This study showed that most of the health care providers had low application of preventive behaviors. Since this population group in Iran is most likely to suffer from the consequences of unsafe patient handling practices, which may lead to chronic LBP, performing researches to evaluate the causes of insufficient safe behaviors and planning educational interventions aimed at improvement of safe patient handling and movement tasks are strongly recommended in Iran.

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