Patient Safety & Quality Improvement Journal
http://psj.mums.ac.ir
PSQI

Effect of Patient Fall Prevention Program on Nurses' Knowledge and the Number of Patient Falls in one of the Teaching Hospitals in Mashhad during 2019

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ARTICLEINFO

Article type:
Original Article

***Article History*:**
Received: 02-May-2020
Accepted: 26-Oct-2020

Key words:
Nurses, Patient fall, Patient safety, Prevention, Prevention program.

ABSTRACT

Introduction:
This study aimed to evaluate the effect of a patient fall prevention program on nurses' knowledge and number of patients falls in one of the teaching hospitals in Mashhad, Iran.

Materials and Methods:
This quasi-experimental study was conducted on 600 nurses working in a hospital affiliated with Mashhad University of Medical Sciences, Mashhad, Iran. The participants were selected via a proportionate stratification sampling method. The fall prevention program included two educational posters and a booklet that introduced key points regarding the prevention of patient falls based on the standard guidelines. The participants were asked to respond to a researcher-made questionnaire that measured their knowledge of patient fall prevention at pretest and posttest. The number of patient falls was evaluated before and after the prevention program. Data were analyzed using SPSS software (version 25) through descriptive and inferential (Wilcoxon test). A p-value less than 0.05 was considered statistically significant.

Results:
There was a significant difference between the scores of pretest and posttest regarding the nurses' knowledge ($P<0.001$). Moreover, the examination of the number of falls in three months before and after the patient fall prevention program showed a significant decrease (63%) in the patient falls.

Conclusion:
The results demonstrated that the provision of prevention programs in this study had a significant impact on the improvement of patient safety level by reducing the number of patient falls through increasing the knowledge of nurses and awareness of patients.

► ***Please cite this paper as:***
*Saadati Z, *Sadeghnezhad M, Siasar M, Rajaeinasab M, Touri M. Effect of Patient Fall Prevention Program on Nurses' Knowledge and the Number of Patient Falls in one of the Teaching Hospitals in Mashhad during 2019. Journal of Patient Safety and Quality Improvement. 2020; 8(4): 187-192. Doi: 10.22038/psj.2020.48423.1272*

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Introduction

Patient safety is considered a criterion of health care quality all over the world (1). Patient fall is one of the most frequent "Never Events" in hospitals and comprise 20-30% of these reported events (2). A widely accepted definition of patient fall is "an unplanned descent to the floor with or without injury to the patient". According to the Agency for Healthcare Research and Quality report, one million patient falls occur annually; however, only one-third of them are preventable (3,4).

Internal and external risk factors are related to the patient falls. Internal risk factors consist of factors related to the patient's demographic characteristics or the nature of the disease. Patient age (especially those between 60-65 years) as an internal risk factor has a significant correlation with fall events (5). Other internal risk factors include gender (female), optical problems, musculoskeletal disorders, hypotension, anemia, arrhythmia, unstable stature, dizziness, low conciseness, memory disorders, diabetes, arthritis, coagulation diseases, cancer, and psychologic problems (depression and psychosis). External risk factors are environmental structures, such as the lack of access to a handrail, inappropriate shoes, motor assistance tools, and consumption of some medications, such as sedatives, painkillers, anticoagulants, and muscle relaxants (1,6-9).

Moreover, 30% of the patient falls lead to physical damages that range from simple minor injuries to head injury and serious fractures (2,10). These damages result in the increased length of hospital stay and financial burden. Since some of these injuries result in permanent and irrecoverable disabilities in patients (2,11), fall prevention is a considerable issue. Consequently, many guidelines have been provided to prevent patient falls in different countries (12). The application of fall prevention protocols for patients at risk is a necessary measure for the improvement of patient safety. On the other hand, clinical managers should consider staff empowerment for the indication of risk factors and application of preventive measures as soon as possible (13). Nevertheless, the number of patient falls is still high, and the decisions of safety committees are not as effective as they should be. Moreover, nursing personnel has spent little time in addition to the assessment of patient condition for determination of fall risk factors (14). Nurses play a major role in the prevention of "Never Events" that threaten patient safety (11,15-17). However, the cooperation and mutual support of all team members are essential, especially when nurses encounter work overload (16).

In Iran, the treatment deputy of the Ministry of Health and Medical Education has developed the guideline for patient fall prevention (7). Although patient fall prevention programs have many proven benefits, few interventional studies have been conducted on this issue in Iran. Moreover, the authors of the present study have observed a high number of patient falls in their centers. Therefore, this study aimed to determine the effect of a patient fall prevention program on nurses' knowledge and the number of patient falls in one of the teaching hospitals in Mashhad, Iran.

Materials and Methods

This study was conducted based on a quasi-experimental research method with a pretest-posttest design. The study population consisted of 600 nurses working in a teaching hospital in Mashhad during 2019 and were selected via proportionate stratified sampling. The inclusion criteria were a clinical nursing experience for at least one year and a willingness to participate in the study.

The patient fall prevention program included the distribution of one educational booklet and two posters. Educational posters contained key points for nurses regarding the prevention of patient falls. After the pretest, participants were sent to all clinical wards. Patients' poster was placed in the patient rooms and nurses' posters were fixed in the nursing station. Moreover, brief educational booklets related to patient fall prevention were sent to the head nurses to train their staff. Content of these booklets includes key measures to prevent patient falls, which was adopted from the guidelines of the Iran

Ministry of Health and Medical Education for patient fall prevention. The data were collected using a researcher-made questionnaire, which assessed the nurses' knowledge about key measures to prevent patient falls in the hospital. The questionnaire includes five multiple-choice items that were designed based on the guideline of patient fall prevention developed by the Iran Ministry of Health and Medical Education. Every correct response scored 1, and the maximum score each participant could obtain was five. In order to measure the validity of the questionnaire, a panel of five educational supervisors, three nursing educators, and two nursing managers were asked to give relevant suggestions to assess its content validity. Following that, the reliability of the questionnaire was assessed using the test-retest method. The Correlation-coefficient of the questionnaire was calculated to be 78.8% in all cases. This questionnaire was used at pretest and posttest to evaluate nurses' knowledge before and after the prevention program. All nurses who participated in this study were given a pretest before the distribution of educational posters and booklet. The posttest was administered eight weeks following the prevention program. Furthermore, the number of patient falls was evaluated and compared during three months before and after the implementation of the prevention program.

The data were analyzed using SPSS software (version 25) through descriptive (mean±SD) and inferential (Wilcoxon test statistics). A p-value less than 0.05 was considered statistically significant.

Results

According to the demographic characteristics, the mean±SD age of the participants was obtained at 39.3±8 years, and the majority of the participants were female (72.8%).

Moreover, the mean work experience of the participants was estimated at 6.5±4.9 years (Table 1). The normality of the pretests and posttest scores was assessed using the Kolmogorov-Smirnov test, which showed a non-normal distribution of the scores ($P<0.05$); therefore, the analysis was performed using the Wilcoxon test. The results revealed a significant difference between pretest and posttest scores of nurses' knowledge in terms of patient fall prevention (Table 2).

In addition, the comparison of the number of patient falls in three months before and after the prevention program showed a significant reduction (63%) from 17 to 9 cases. It is worth mentioning that the mean age of all patients with fall events was determined at 50.19 years, and the majority of the patients were male (61.54%). In addition, 73.03% of the cases were hospitalized in medical-surgical units (Table 3).

Table 1: Demographic characteristics of the participants

Variable		Number	Percent
Gender	Male	163	27.2
	Female	437	72.8
Education	Bachelor	556	92.7
	Master of science	44	7.3
Workplace unit	Medical	111	18.5
	Surgery	117	19.5
	Gynecology	27	4.7
	Neurology	77	12.8
	Intensive care unit	143	23.8
	Operating room	69	11.5
	Immunology	6	1
	Cardiology	49	8.2
Variable	Mean	SD	
Age	39/3	8/4	
Work experience	6/5	4/9	

Table 2: Comparison of the Pretest and Posttest Scores

Variable	Pretest		Posttest		Significance level
Scores of nurses' knowledge about patient fall prevention	Mean	SD	Mean	SD	P<0.001
	3.37	1.27	4.33	0.7	

Table 3: Demographic characteristics of the patients and the fall event

Variable		Number	Percent
Gender	Male	16	61.54
	Female	10	38.46
Ward	Medical	9	73.03
	Surgical	10	
	Others	7	26.97
Age	Mean		
	50/19		
Number of patient falls before and after the prevention program	Before	After	Reduction (percent)
	19	7	63

Discussion

The results showed that the patient fall prevention program can improve the nurses' knowledge about the prevention of patient falls and decrease the patient fall rate significantly. Considering the wide range of physical and financial complications caused by the patient falls, a 63% reduction is considerable in the number of patient falls.

According to a study conducted by Valizadeh et al. (2016) on the risk factors of patient falls in the hospital, the age of patients was the most important risk factor. Based on their result, elderly patients are at the highest risk of falls (9). This finding is consistent with the results of the present study in which the mean age of the patients who fell was obtained at 50.19 years. Gu et al. (2015) studied the root causes of patient falls and identified the most important preventive measures in hospital settings. Their review reveals that the most effective multidimensional prevention program regarding patient fall prevention is accompanied with emphasis on the patient assessment, adjustment and preparation of the patient environment, and staff training, compared to one-dimensional programs (18). In addition, O'Neil et al. (2015) in their meta-analysis analyzed the results of 34 interventional studies on patient fall prevention. In the same vein, they considered multifaceted protocols to be more effective than one-dimensional protocols in the prevention of patient falls (19). In the current study, educational posters were applied for patients and nurses simultaneously.

In the same line, Brosey et al. (2015) evaluated the effect of structured nursing rounding on patient satisfaction, the patient fall rate, and the incidence of bedsores in medical-surgical units, considering the high rate of patient fall in these unites. The results showed that the implementation of structured nursing rounds during three months reduced patient falls as well as bed sores and improved patient satisfaction (20). Moreover, most of the participants in this study were working in medical-surgical units. It should be noted that one of the key points in the nurse's educational booklet was the regular visits to patients, especially between 10 pm and 6 am.

The results of a study performed by Gold sack et al. (2015) on the effect of planned patient-centered nursing rounds on patient fall rate showed an emphasis on the active participation of the patient and other team members in the fall prevention program. The key points to preventing patient falls

were noticed every time the nurse was beside the patient. The nurse was also required to examine the patient pain level, need to use the toilet, and patient position in every visit, and provide essentials, such as telephones, TV remote controls, tissues, and trash can. Attention to all these issues reduced the number of falls during one year (21). In this study, the focus of the program was on nurses and patients; however, other team members were not considered. On the other hand, prevention key points, such as the examination of the pain level and the need to toilet, full length bedsides rails, and the availability of essentials for the patients were considered in this study.

Panjaitan et al. (2019) investigated the relationship of knowledge and attitude of nurses with the implementation of the patient fall prevention program in private hospitals. The results of their study showed a significant positive relationship between these two variables (22). The findings also indicated that the promotion of nurses' knowledge had a positive effect on the implementation of prevention programs, which was in line with the results of this study.

Similarly, Shali et al. (2016) evaluated the correlation between the patient fall rate and the level of professional commitment of the nurses. The results of their study confirmed the inverse and significant relationship between patient falls and the level of professional commitment (15). Therefore, it is necessary to utilize some strategies to develop professional commitment in nurses during professional education as an effective factor in the improvement of patient safety. The current study focused only on in-service education for nurses; however, it is suggested to consider nursing students and other team members as well in future studies.

Conclusion

The results of this study showed that the presented fall prevention program was effective in an increase in nurses' knowledge and reduction of patient fall rate. Therefore, clinical managers and nurses can use this prevention program to reduce patient falls as a serious event associated with serious complications and high financial burden.

Acknowledgment

The authors would like to acknowledge all the nurses who participated in this study.

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