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Original Article

Effectiveness of Educational Program on Knowledge and Practices of Nurses Regarding Prevention of Diabetic Foot Ulcers at Tertiary Care Hospital, Lahore

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ABSTRACT

Diabetes is a chronic disease that affects 4.2% of the world's population. Nurses effectively prevent foot ulcers and lower limb amputations by providing educational intervention and health care. **Objective:** To evaluate the effectiveness of a training program on nurses' knowledge and practices related to diabetic foot ulcer prevention. **Methods:** A quasi-experimental pre-post study was conducted in the diabetes clinic and medical departments of Sir Ganga Ram Hospital in Lahore, Pakistan. A total of 36 nurses were randomly selected. After obtaining informed consent, all female nurses aged 23 to 35 years with inadequate knowledge of diabetic foot ulcer prevention were included in the study. The nurses received a 16-week intervention. Nurses' knowledge was assessed using a validated instrument called the Nurses Knowledge Questionnaire related to Diabetic Foot Management Care and an observation checklist for nurses' practice related to neurovascular assessment of diabetic patients before and after the intervention. Data were entered and analyzed using SPSS version 24.0. **Results:** The results showed that most of the participants were from 26 to 30 years, 19 (52.8) were single with educational level of nursing diploma (50.0%). Participants were having 2 to 5 years of experience. After the intervention there were 4 (11.1%), 13 (36.1%) and 19 (52.8%) participants having poor, moderate and good knowledge respectively regarding prevention of diabetic foot ulcers. There was a significant difference between pre and post interventional score of practice and knowledge among nurses (p value <0.001). **Conclusions:** Nurses have poor knowledge and practice regarding diabetic foot care but after the intervention it increases significantly.

INTRODUCTION

Diabetes is a chronic, complicated disease that affects 4.2% of the world's population [1]. Approximately 7.5 million people suffer from diabetes mellitus and 10% people develop peripheral neuropathy and peripheral vascular diseases and 15% chance of developing diabetic foot ulcers. The amputation rate due to diabetic foot ulcers is reported to be high ranging from 21.0%9 to 48.0% in Pakistan [2]. Diabetic Foot ulcers (DFU) results in the hospitalization of diabetic patients. Moreover, patients with foot ulcers have higher risk of lower limb amputations, which is a major problem [3]. DFU can be grouped into neuropathies, ischemic neuropathy or ischemic. Loss of protective sensation (LOPS) is present in diabetic patient due to neuropathic ulcers. Healthcare providers improve the quality of life of diabetic patients by preventing episodes or recurrences of diabetic foot through an efficient and accepted method [4]. A routine foot examination by an assistant or caregiver includes the assessment of foot care and skin examination [5, 6]. Furthermore; primary healthcare is the most important type of care provided to the patient. The nurses' role in preventing diabetic foot is crucial [7]. The nurse's knowledge and practice in providing foot care is essential for improvement in outcomes of diabetic foot ulcer. The number of diabetic foot ulcers and foot amputations has increased as a result of the lack of a standardized method for DFU. Important problems for the health care system include patients who lack poor knowledge and behaviors

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regarding foot care, nurses with poor assessments and knowledge of DFU, health care workers with poor understanding of neuropathy assessments and foot screening investigations. The primary role of the nurse is to educate patients on proper foot care and to screen them for foot ulcers [8]. Furthermore nurses play vital role in providing diabetic care health services at primary, secondary and tertiary level as they are the primary source of health care delivery. It is important for nurses to enhance their knowledge and skills regarding diabetes foot care and early detect the cases of high risk foot. So that high risk diabetic patients prevent from amputation and other complications of diabetic foot. Continuity of nursing education can increase quality practice and decrease the morbidity and mortality rate related to DFU. Therefore the objective of study was to evaluate the effectiveness of an educational program on knowledge and practices of nurses regarding prevention of diabetic foot ulcers at tertiary care hospital Lahore.

METHODS

A quasi-experimental pre-post study was conducted in the diabetes clinic and medical departments of Sir Ganga Ram Hospital in Lahore, Pakistan. A total of 36 nurses were randomly selected. Sample size was calculated by using Post-test Nurses' knowledge total score (23.4 ± 2.2) by using 5% level of significance [9]. After obtaining informed consent, all female nurses (BSN RN, Diploma Nurses, MSN) aged 23 to 35 years with inadequate knowledge of diabetic foot ulcer prevention were included in the study. The nurses who were not in direct contact with diabetic patients, perform duties in critical care unit and already certified in diabetic /foot care management were excluded from the study. The research scholar developed an interventional program. The intervention was developed in the form of booklet and power point presentation by reviewing past and recent literature. All the material for intervention was developed from Guidelines for diabetic foot care: A template for the care of all feet [10]. Nurses were given 16 week Educational intervention provided to nurses to improve their knowledge and practice regarding diabetic foot ulcer. Each session lasted 90 minutes. Participants were given a multimedia presentation, demonstration and group discussions for better understanding. Nurses' knowledge was assessed using a validated instrument called the Nurses Knowledge Questionnaire related to Diabetic Foot Management Care and an observation checklist for nurses' practice related to neurovascular assessment of diabetic patients before and after the intervention. It is a validated tool designed only for the nurses knowledge assessment. Validity and reliability of tool was 0.90. The nurses' knowledge questionnaire on diabetic foot management consists of 68 questions. It includes 4 sections which are:

1) Knowledge regarding Risk Factors which have 16 questions
2) Knowledge regarding Foot examination which has 10 questions
3) Knowledge regarding Application of preventing foot complications which includes 32 questions
4) Knowledge regarding Foot wear selection which have10 questions.

Score of knowledge was concluded as good (more than75), moderate (50-75) and poor knowledge (less than 50) [7]. The nurse's practices were ranked as follows "Not done = 0, incompletely done = 1 and completely and correctly done = 2.

Data were entered and analyzed using SPSS version 24.0. Comparison of knowledge and practice scores before and after the intervention was analyzed using a paired t sample. A p-value ≤ 0.05 was considered statistically significant.

RESULTS

Demographic details of the participants are summarized in Table 1. Majority of the participants were from 26 to 30 years, 8 participants were from age group 21 to 25 years and remaining 9 participants were above 30 years of age. There were 17 (47.2%) married participants Majority of the participants 18 (50%) had nursing diploma, whereas only 8(22.2%) participants had completed their bachelors and remaining 10 (27.8%) participants had specialization. Out of 36 participants, 5 (13.9%) participants were from ICU, 28 (77.8%) and 3 (8.3%) were from medical ward and mixed services respectively. Total 18(50.0%) of the participants were having 2 to 5 years of experience, 15(41.7%) had 6 to 10 years' experience and rest 3 (8.3%) had 11 to 15 years of experience. Participants' experience in working unit, majority of the participants were having 7 months to years of experience in same working unit, the others 3 and 16 participants were working for less than 6 months and above 2 years respectively. Five (13.9%) were executive nurses, 13 (36.1%) were polyclinic nurses and 18 (50.0%) were ICU nurses.

Variables	Frequency (%)
Age (years)	
21 to 25	8 (22.2)
26 to 30	19 (52.8)
31 or above	9 (25.0)
Marital Status	
Married	17 (47.2)
Single	19 (52.8)
Education	
Bachelors	8 (22.2)
Specialization	10 (27.8)
Nursing Diploma	18 (50.0)

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Working Unit	
ICU	5 (13.9)
Medical Ward	28 (77.8)
Mixed Services	3 (8.3)
Experience	
2 to 5 years	18 (50.0)
6 to 10 years	15 (41.7)
11 to 15 years	3 (8.3)
Experience in Working Unit	
< 6 months	3 (8.3)
7 months to 2 years	17 (47.2)
> 2 years	16 (44.4)
Designation	
Executive Nurse	5 (13.9)
Polyclinic Nurse	13 (36.1)
ICU Nurse	18 (50.0)

Table 1: Demographic Variables of the study participants

Table 2 depicts that in the pre-interventional phase, all participants (32) had poor knowledge. Whereas in the post-intervention phase there were 4 (11.1%), 13 (36.1%) and 19 (52.8%) participants having poor, moderate and good knowledge respectively regarding prevention of diabetic foot ulcers. The findings showed that there was a significant difference between the pre and the post interventional knowledge's score among participants regarding the prevention of diabetic foot ulcers as evident by p value <0.001. Moreover, when practice has categorized into poor, fair and good; results depict that in pre interventional phase majority of the participants were having poor practices 29 (80.6%) while only 7 (19.4%) were experiencing fair practices. And in post study group majority of the participants 61.1% experienced fair practices and remaining 38.9% were having good practices regarding prevention of diabetic foot ulcers. The findings revealed that there was a significant difference between pre and post interventional score of practice among participants as evident by p value <0.001.

Variables	Pre intervention No. (%)	Post intervention No. (%)	Test value	p-value
Knowledge				
Poor	36 (100.0)	4 (11.1)	-5.186*	< 0.001
Moderate	0 (0)	13 (36.1)		
Good	0 (0)	19 (52.8)		
Practice				
Poor	29 (80.6)	0 (0)	-13.105**	< 0.001
Fair	7 (19.4)	22 (61.1)		
Good	0 (0)	14 (38.9)		

Table 2: Comparison of Pre and Post Knowledge and Practice Categories

*Wilcoxon Signed Rank Test ** Paired Sample t-test

DISCUSSION

Diabetic foot ulcers are greatly influenced by a lack of adequate education and awareness of routine foot care. The incidence of foot ulcers and amputations can be reduced by a targeted education and training program on foot and wound care. Nurses, however, are the main point of contact for patients and are considered by them to be knowledgeable sources. Moreover to fulfill this role, nurses must be knowledgeable about diabetic foot care management and pass this knowledge on to patients. In current study it was documented that in the treatment and prevention of diabetic foot ulcer nurses play a vital role. Moreover there education, knowledge and practice about diabetic foot care is important. The results of current study showed that the majority of the participants were from 26 to 30 years, 19 (52.8) were single with educational level of nursing diploma (50.0%), and participants were having 2 to 5 years of experience. The 5 (13.9%) were executive nurses, 13 (36.1%) were polyclinic nurses and 18 (50.0%) were ICU nurses. However our data show a substantial gender gap, with women making up the majority of the workforce that is included in the current study. These findings are similar to a study which reported that more than half of the nurses were females. The age of nurses was between 25-30 years and single. They were under-graduate and 21.1% work in ICUs with up-to 5 years of experience [7]. In this research the practice and knowledge of nurses before and after intervention. The results revealed that there was a significant difference between the pre and the post interventional Median Knowledge Score (Pre= 27 vs. Post = 52) among nurses regarding the prevention of diabetic foot ulcers as evident by (p value <0.001). The overall knowledge of nurses was increased after intervention. In addition there, practices also become better after intervention. After intervention majority of the nurses 61.1% experienced fair practices and remaining 38.9% were having good practices regarding prevention of diabetic foot ulcers. Ren and coworkers investigated the level of knowledge of nurses about diabetic foot ulcers. Despite the fact that the majority of nurses had no training in diabetic foot care, they were adequately informed [11]. As a result, the knowledge levels of the nurses varied. This could be due to the educational background of the nurses or their participation in continuing education programs after their basic training. Therefore, it is important to determine the level of information about diabetic foot care among nurses working in the facilities, to fill any knowledge gaps, and to eliminate misconceptions [12]. In another study on the evaluation of nurse's knowledge and practice regarding diabetic fool ulcer showed that the nurses have good knowledge score regarding the prevention of diabetic foot ulcer but their practices showed poor score [13]. Moreover it was reported a moderate positive correlation between the knowledge and practices of nurses in diabetic foot

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complications. It was concluded that the early detection and management of diabetic foot ulcer can prevent the worse outcomes of disease [14]. Only 56% of nurses who participated in a survey assessing nurses' knowledge and attitudes had a good knowledge of diabetic foot ulcers, it found. Sixty-seven percent of respondents reported having no formal training in wound care. Nurses' attitudes were generally positive. Overall, nurses showed positive attitudes toward patients with diabetic foot ulcers. However, they noted a lack of basic information [15]. Despite less experience, young, lively nurses were found to have a higher level of understanding of diabetic foot care. Experienced nurses noticeably lacked expertise in diabetic foot care. The conclusions are useful for developing educational programs. Patients will receive better diabetic foot care as a result [16]. However, the prevention of diabetic foot problems also involves patient education. Therefore, nurses should be involved in developing and implementing educational programs that improve patients' quality of life and self-care habits [17-19]. To meet the educational needs of nurses, theoretical and practical education programs on diabetic foot management should be planned. Training programs that combine theory and practice help nurses improve their knowledge and skills in caring for the feet of diabetic patients[20].

CONCLUSIONS

Nurses have poor knowledge and practice regarding diabetic foot care but after the intervention it increased significantly. Patient education and prevention of diabetic foot complications benefit from the knowledge of the nurse. The conclusions are useful for developing educational programs. Patients will receive better diabetic foot care as a result. Nurses are an important factor in educating patients, which can lead to a significant change in their behavior, self-management, and quality of life.

Conflicts of Interest

The authors declare no conflict of interest.

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