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ASSESSMENT OF KNOWLEDGE AND ATTITUDE OF NURSES REGARDING DIABETIC FOOT CARE

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ABSTRACT

Background: Diabetes is one of the leading cause of mortality and morbidity. Diabetic foot is one of its unbearable complication that have led to incalculable amputations and reduced quality of life among diabetics. Diabetic foot ulcer is a preventable complication of diabetes if we deal with it timely. Diabetic foot wound affecting approximately 12% of the total population with diabetes mellitus in Pakistan. Nurses plays an important role in diabetes management team. They can play important role in the prevention of diabetic foot and in educating the patient at risk of developing diabetic foot problems. **Objective:** The aim of current study was to access the knowledge and attitude of nurses on diabetic foot prevention, care and management. **Methodology:** It is a cross-sectional descriptive study done at Pakistan Institute of Medical Sciences Islamabad for period of three month from August 2018 to October 2018. Data was collected from 150 nurses through pretested, structured questionnaire containing question to access the knowledge, attitude and practice regarding diabetic foot prevention, care and management. We included all the nurses who processed atleast one year of experience in surgical ward and specifically encounter patient with diabetic foot wounds. Data was collected and scored accordingly. The statistical analysis was performed through SPSS version 19.0. **Results:** Only 56% of the nurses in our study possessed good knowledge of diabetic foot ulcers. Lack of formal wound care training was reported by 67%. The overall attitude of nurses towards was positive. Nurses demonstrated an overall positive attitude towards patients with diabetic foot ulcers. Although 94% of nurses were interested in wound care, only 5.5% wished to do research in this topic. However, we noticed that there is deficiency in core knowledge. Significant associations were seen between nurses' knowledge and duration of nursing. It was observed that the knowledge of diabetic foot care was higher among young energetic nurses despite of less experience. Nurses with experience had a markedly poor knowledge of diabetic foot care. The findings are helpful for instituting training courses. As a result, quality of diabetic foot care for patients will be improved. **Conclusion:** Deficiency in core knowledge may be due to inadequate training, inadequate update of knowledge and lack of interest in wound care research work. Lack of knowledge effect healthcare system badly, even with the presence of positive attitudes. Hence, a comprehensive revision of nursing courses, training and updating their knowledge is need of hour.

KEYWORDS: Diabetes Mellitus, Diabetic Foot Ulcer, Diabetic Foot Care Knowledge, Diabetic Foot Care Behaviors, Nurses knowledge & Practice, Primary health care center, Diabetic foot complications.

INTRODUCTION

Diabetes mellitus is an alarming health issue affecting one's life quality which can be prevented by patient education and early diagnosis-treatment. In Pakistan, approximately 7.5 million people suffer from the diabetes mellitus and this ratio is expected to get doubled by 2030.[1] Diabetes mellitus is not promptly treated can lead to chronic complications which include, neuropathy, coronary artery disease, cerebrovascular disease, and peripheral vascular disease.[2] Peripheral neuropathy, peripheral vascular, recurrent chronic abrasions, bullae, various irritations, improper cutting of toenails, fungal infection, poor foot hygiene, inappropriate footwear use, and bad metabolic control are risk factors for diabetic foot disease. Diabetic foot refers to an area of necrosis or gangrene distal to the ankle in a diabetic patient. Diabetic foot problems can cause the patient to lose work, income and damage social relations. All these factors cause harm to patients psychologically which further deteriorate the existing disease.[3,4,5] In order to control these risk factors and diabetic foot management, all patients with diabetes should undergo foot screening and assessment every 6 months, education of patients, family, and health workers is mandatory.[6] Foot screening and assessment aimed at

preventing the serious complications of ulceration and amputation. A patient at risk should wear therapeutic shoes that reduce plantar pressure while walking to prevent recurrent plantar foot ulcers.[7] The worldwide prevalence of a diabetic foot ulcer (DFU) is 3%-10% whereas there is a 15 % chance of diabetics developing a DFU during their lifetime.[6] Recent research techniques have influenced the options for the treatment of chronic wounds. Several studies have shown that advanced biologic therapies, in combination with standard care, improve the healing of diabetic foot ulceration.[10]

The diabetic foot wound needs a multidisciplinary team approach because it requires long-term treatment utilizing many areas of medical expertise. The members of the diabetic foot care team usually consist of a general practitioner, nurse, educator, vascular surgeon, infection disease specialist, dermatologist, endocrinologist and orthopedic surgeon.[8,9] Although all these members should play their role to educate the patient, the nurse and podiatrist are often the primary sources of patient information. Nurses are the primary point of contact for patients and are seen as a source of information by patients. In order for nurses to fulfill this role, they must have knowledge regarding diabetic foot care management and convey this knowledge to the patient.[9]

Lack of proper education and awareness regarding regular foot care play critical role in diabetic foot ulceration. A specific awareness campaign and education course for foot and wound care decreases the rate of foot ulcers and amputations.[11] In fact, educating patients on foot self-care is considered the keystone to prevent diabetic foot ulcers. The goals of training are to motivate the patient and create adequate skills to maximize the use of preventive methods. However, nurses are the primary point of contact for patients and are seen as a source of information by patients. In order for nurses to fulfill this role, they must have knowledge regarding diabetic foot care management and convey this knowledge to the patient.[12] In current study we evaluated the knowledge level of nurses in diabetic foot care and use of this knowledge in patient care.

METHODOLOGY

It is a cross-sectional descriptive study done at Pakistan Institute of Medical Sciences Islamabad for period of three month from August 2018 to October 2018. Data was collected from 150 nurses through pretested, structured questionnaire containing question to access the knowledge, attitude and practice regarding diabetic foot prevention, care and management. Response rate was 100 percent. We included all the nurses who processed atleast one year of experience in surgical ward and specifically encounter patient with diabetic foot wounds. Data was collected and scored accordingly.

The questionnaire, based on three sections. First section includes age, gender, professional experience, and qualifications etc. Second section was to access the level of knowledge possessed by nurses about diabetic foot ulcers and their management through the multiple-choice format questionnaire. The three options provided for each question were "Yes," "No," and "I do not know," The scoring criteria worked as follows: each correct answer scored 1 (one) whereas incorrect answers or marked "I do not know" received a score of zero. A mean score was generated using the results and the level of knowledge classified into two groups. The attitudes of nurses in relation to diabetic foot care were explored in the third section of our study. The statistical analysis was performed through SPSS version 19.0.

RESULTS

We got response from 150 nurses and only who gave response were included in the study. Their demographic characteristics are shown in Table 1. The majority of the participants were female (n = 140, 93.3%) and 75.2% were below the age of 45 years. Most nurses in the study sample were employed in surgical wards (n = 125, 83.3%), while the others were employed in dressing rooms of the OPD where wound care is provided to outdoor patients.

The knowledge of the nurse was accessed through 15 self-created questions and results were as: 15% of nurses had very low, 18% had low, 17% had moderate, 39% had high and 11% had very high knowledge. The mean knowledge score was 74.2. The nurses' knowledge on individual questions on diabetic ulcers is shown in Table 2. Of the 15 items tested, eight items were answered correctly by more than 75% of participants. All nurses in the study sample knew that infected, highly exuding wounds should be cleansed daily. However, the items on the impact of ischemia in increasing the risk of amputation in diabetic ulcer patients and the importance of mechanical off-loading in ulcer healing were answered correctly by <50% of nurses in the study. The positive knowledge percentage of four domains, predisposing factors, characteristics of ulcers, complications of ulcers and ulcer care were 51%, 39%, 36% and 68% respectively. Table no. 4 shows the percentage distribution of nurses having good versus poor knowledge with regard to the knowledge in four domains. The nurses' knowledge showed significant associations with their experience in nursing as well as in wound care and the attached unit of work. However, no associations were seen between knowledge and their gender, age and professional qualifications etc. Only a minority of nurses rated their knowledge on diabetic ulcers neither as excellent (2.3%) nor as poor (1.1%). The majority (64.6%) rated as satisfactory and 31.4% as good. The range of attitude scores from 10–50. According to this study, the overall attitude of nurses towards caring of patients with diabetic ulcers was positive. Table 3 shows scores obtained by nurses for individual questions. When examining the attitudes in different aspects of diabetic ulcer care, it is interesting to note that most nurses were satisfied by caring for diabetic ulcers (94.4%), did not like to avoid caring for

diabetic ulcers (92.2%), considered regular diabetic ulcer assessment as necessary (95%) and felt that it is their responsibility to educate patients on reducing re-ulceration (88%).

We found that except for two nurses, all others (94%) showed some degree of interest in diabetic ulcer care. Most nurses (66%) were interested and wished to follow a training course in ulcer care. However, only a minority (5.5%) were interested in engaging in ulcer care research.

Table 1: Demographic characteristics of the participants (n = 150).

Variables	n	%
Sex		
Female	141	94
Male	9	6
Age (in years)		
≤ 30	75	50
31-45	35	23.3
46-60	40	26.6
Professional qualification		
Student nurse	20	13.3
Diploma holders	95	63.3
Post diploma	16	10.6
Degree	19	12.6
Nursing experience (in years)		
≤5	65	43.3
6–15	53	32.3
16–30	28	18.6
>30	4	2.6
Wound care experience (in years)		
≤5	75	0.5
6–10	33	22
11–15	19	12.6
16–20	7	4.6
>20	16	10.6
Formal training in wound care		
Yes	15	10
No	135	90

Table 2: Frequency and percentage distribution of nurses' knowledge on diabetic ulcer disease (n = 150).

Item	Response rate		
	Correct (%)	Incorrect (%)	Don't know (%)
1. Neuropathy is the predominant factor responsible for diabetic ulcers (True)	60	28	12
2. Sensory neuropathy results in unnoticed skin damages which lead to formation of ulcers (True)	96.6	2.0	0.4
3. Autonomic neuropathy is associated with dry skin which predisposes to ulcer formation (True)	84	10	6
4. Diabetic neuropathic ulcers are typically found on weight bearing areas of the foot (True)	70	26.5	4.5
5. Diabetic ischemic ulcers are less painful than diabetic neuropathic ulcers (False)	65	25.5	9.5
6. Neuropathy can be excluded if the foot skin is cool and pulses are absent (False)	78	13	9
7. The risk of amputation is higher when diabetic foot ulcer is associated with limb ischemia (True)	40.1	51.7	8.2
8. Presence of slough is not an indication of infection in diabetic ulcers (False)	98	1.3	0.7
9. Presence of osteomyelitis impairs healing of diabetic ulcers (True)	89.2	5.4	5.4

10. Wound healing progress is unsatisfactory if the wound bed appears pink (False)	86.9	10.1	3
11. Mechanical off-loading should be advised to facilitate ulcer healing (True)	46.3	50.3	3.4
12. Hyperbaric oxygen therapy is recommended for ulcer healing even in a well-perfused foot (False)	90.5	7.1	2.4
13. Infected, highly exuding wounds should be cleansed daily (True)	100	0.0	0.0
14. Iodine dressings are effective for wounds with clinical signs of infection (True)	71.3	25	3.7
15. Hydrogel dressings are useful to rehydrate the wound bed and control the moisture in wounds (True)	88	7.8	4.2

Table 3: Nurses attitude towards diabetic ulcer care (n = 150).

Item	Strongly agree n (%)	Agree n (%)	Neither agree nor disagree n (%)	Disagree n (%)	Strongly disagree n (%)
1. I think diabetic ulcer treatment is more important than ulcer prevention	5 (3.4)	4 (2.7)	7 (4.8)	71 (48.3)	60 (40.8)
2. I do not think it is necessary to assess diabetic ulcers regularly	2 (1.4)	2 (1.4)	4 (2.7)	74 (50.3)	65 (44.2)
3. Diabetic ulcer care is too time consuming for me to carry out	1 (0.7)	12 (8.2)	23 (15.6)	78 (53.1)	33 (22.4)
4. In comparison with other areas of nursing care, diabetic ulcer care is a low priority task for me	1 (0.7)	4 (2.7)	13 (8.8)	69 (46.9)	60 (40.9)
5. If I have the opportunity, I would like to avoid caring for diabetic ulcers	2 (1.4)	1 (0.7)	4 (2.7)	38 (25.8)	102 (69.4)
6. I do not have time to advise each patient individually on how to look after their ulcers	2 (1.4)	10 (6.8)	15 (10.2)	74 (50.3)	46 (31.3)
7. It is not my responsibility to educate patients with diabetic ulcers on how to reduce re-ulceration	0.0	5 (3.4)	9 (6.1)	83 (56.5)	50 (34.0)
8. I cannot think about pain when cleaning diabetic ulcers	2 (1.4)	48 (32.6)	23 (15.6)	62 (42.2)	12 (8.2)
9. I do not like to care for diabetic ulcers in my practice	0.0	11 (7.5)	23 (15.6)	87 (59.2)	26 (17.7)
10. I do not get satisfaction by caring for diabetic ulcers	0.0	0.0	7 (4.8)	85 (57.8)	55 (37.4)

Table 4: Proportions of nurses (%) representing the knowledge levels regarding four areas of knowledge assessment.

Domain of knowledge	% having good knowledge	% having poor knowledge
Predisposing factor	51	49
Ulcer characteristic	39	61
Ulcer complication	36	64
Ulcer care	68	32

DISCUSSION

A vast research on diabetic foot ulcers disclosed that there's a scarcity of native and international data focusing on knowledge of tending employees and their attitudes. A study conducted in a Sri Lankan clinical setting coincides with our observation. Our data unconcealed a large gender gap, with females constituting a predominant portion of the interviewed workforce. This pattern of gender inequality has been ascertained in multiple nursing studies worldwide.[12] Moreover, around fifty-three percent of the nurses were older than thirty years older. An ageing workforce, whereas experienced, is also more vulnerable to develop various disorders because of intense work.[13] Our data indicate that although 46.8% of the nurses possessed wound care experience of more than 5 years, not even 1% of the sample population had received formal wound care training. In a Swedish study where nurses lacked comprehensive wound care training despite a decade of professional experience.[14] A study performed among nurses in Ethiopia revealed 91.1% of participants lacked

any wound care training.[15] This is a worrisome finding because a lack of training can serve as a potential barrier for nurses to translate their preexisting knowledge on ulcer care into practice.[13] In accordance with the Macdonald's standard of learning outcomes, only 54% of the participants were adequately knowledgeable (range 80-100).[14] This finding is similar with a study conducted in Sri Lanka, which reported similar knowledge scores.[15] In the past a survey done in Bangladesh revealed that the mean knowledge of nurses regarding the prevention of diabetic foot ulcers was only 52.60%.[16] In this current study the results regarding foot care knowledge was unsatisfactory because we expected nurses employed in tertiary care hospitals and are expected to possess widespread knowledge. A low level of knowledge can be attributed to the participants' basic knowledge and their professional expertise. Only 14.0% of the nurses had a basic degree whereas 53.2% of the participants had wound care experience of less than or equal to five years. It can also be argued that basic nursing degrees and diplomas are not centered on updated information pertaining to ulcer care.[17] An individual analysis of the four knowledge domains revealed that the highest percentage of nurses possessed a good knowledge of ulcer care. However, they depicted a poor grasp of the characteristics and the complications of ulcers. These individual knowledge findings can reflect the primary focus of nursing curricula at tertiary care hospitals. The assessment of knowledge on individual items helps assess the primary features of the nurses' routine practices. Ninety-four percent of the nurses were aware that slough presence is indicative of infection in diabetic ulcers. Nevertheless, routine practices have been found to influence nurses' clinical acumen and are not commonly updated. This redundancy in clinical practice can be attributed to the general lack of knowledge in the nursing workforce.[18] A question aimed at evaluating risk assessment for amputations in DFUs was answered incorrectly by 50% of the nurses. In a Nigerian study where 73% of participants nurses had incorrect responses regarding risk assessment.[15] This is in contrast to a multicenter study conducted in Sweden, which reported high scores for risk assessments in pressure ulcers.[12] It is well-known that nurses specialize in evidence-based practice to carefully prevent and manage diabetic foot ulcers. Forty-eight percent of the nurses were unaware of the significance of mechanical offloading for the healing of DFUs. This reflects that evidence-based practice has been ignored in the nursing curriculum. The survey on nurses' knowledge in Bangladesh also concluded that their clinical settings did not primarily focus on evidence-based care.[14]

Our study found a momentous association between nurses' knowledge and their wound care and nursing experiences, wound care training, and work units. Astonishingly, our study found that nurses' knowledge was significantly correlated with a professional and wound care experience of five years or less. A study conducted at Brazilian University Hospital, which revealed that nurses with greater years of experience had lower knowledge scores.[19] A study done at the University of Copenhagen found no noticeable link between nurses' knowledge and the duration of their professional experiences.[11] However, there have been large number of studies that report conflicting findings and establish a significant association between nurses' knowledge and years of experience.[16] This finding of the study can help us to establish a dual conclusion. It possibly reflects that younger graduates have a more comprehensive knowledge of nursing principles. Furthermore, this also demonstrates a lack of effort put in by older nurses to update their skills.[19] We also observed that nurses in OPDs had better knowledge, as compared to those working in surgical ICUs. This can possibly be linked to a higher frequency of patients in outpatient departments and, hence, providing for greater clinical exposure to nurses. However, contrasting findings have been reported in other studies where nurses deployed in surgical units performed better on knowledge tests.[18] Multiple studies have reported a significant link between wound care training and the knowledge possessed by nurses.[9] An Ethiopian study on pressure ulcer prevention observed higher levels of knowledge in nurses who had received formal wound care training.[8]

Various nursing studies have explored nurses' self-perception of knowledge and the common sources used by them to enhance their knowledge. In this 70% of the nurses knowledge was satisfactory. This finding coincides with a similar study on Sri Lankan nurses.[20] A potential explanation could be that nurses might not be aware of the limitations in their current knowledge, which may have created a false sense of confidence.[20] Knowledge sharing with colleagues and various educational activities were the most popular knowledge enhancing sources used by participants in the study. A study conducted in Huddersfield, UK, found that a majority of nurses are dependent on professional development programs for improvements in knowledge.[21] An inclination towards these methods could, however, be a consequence of lack of access to technology at the workplace. An important limitation of obtaining knowledge from colleagues could be ignorance of ideal practice methods because specialists can generally mold guidelines to suit their time constraints. Nevertheless, it is important to recognize contrasting results. A clinical study conducted in Saudi Arabia documented unsatisfactory scores for nurses' attitude and reported that 10.7 % of the participants believed that prevention of ulcers is a time-consuming process.[22] Translation of attitudes into work practice can be hindered by various barriers. Moore and Price identify a shortage of time and work personnel as two important factors in limiting effective ulcer care.[17] A shortage of staff can push ulcer care and prevention down the priority list although our current results indicate that 85.4% nurses perceive DFU care as a high-priority task. Our study found that age significantly influenced nurses'

attitudes towards ulcer care with younger nurses harboring a more positive attitude. Nevertheless, there was no significant association between the nurses' knowledge and attitudes. In contrast, a study conducted on Belgian nurses concluded a correlation between knowledge and attitudes and established a link between work practices and attitudes.[22] In our study, nurses' attitudes were not influenced by their wound care experiences. This finding coincides with the results of the study conducted by Beckman et al. where nurses' attitudes were unaffected by formal wound care training.[22] A majority of the nurses in our study demonstrated a great interest in diabetic ulcer care.

Nurses' interest was found to significantly influence their attitudes and knowledge. Moreover, nurses with good knowledge and positive attitudes were more inclined to participate in ulcer training courses and research projects. Nevertheless, only 5% of nurses showed an interest in pursuing ulcer care research. The merits of research in advancing evidence-based practice should be further highlighted to increase participation among nurses.

CONCLUSION

Gaps in core knowledge may be due to inadequate training, suboptimal update of knowledge and lack of interest in wound care research. Lack of knowledge effect healthcare system badly, even with the presence of positive attitudes. Hence, a comprehensive revision of nursing courses, training and updating their knowledge is need of hour.

Conflict of Interest

Authors declares no conflicts of interest.

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