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Research Article

KNOWLEDGE ATTITUDE AND PRACTICES AMONG NURSES REGARDING DIABETIC FOOT CARE AT LAHORE GENERAL HOSPITAL, PAKISTAN

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Abstract:

Introduction: Diabetic foot ulcers is one of the most crippling complications of diabetes. Wound care requires prompt vigilance and significant utilization of healthcare resources. It is highly suggestive that healthcare workers must possess comprehensive command on their updated knowledge regarding pathophysiology along with a positive attitude to ensure better healthcare goals. Our literature search revealed a paucity of evidence pertaining to diabetic foot ulcers. Therefore, this study aims to evaluate the knowledge and attitudes of nurses rendering diabetic foot care.

Methods: A cross-sectional study design was developed, a validated and tested questionnaire was used to collect data from a sample size of 300 nurses working at Lahore General Hospital, Pakistan. The study was conducted over a period of three months (June 2018 to January 2019) and included all nurses who possessed at least one year of clinical experience in surgery department. The statistical software employed was SPSS version 19 (IBM Corp., Armonk, NY, US). Statistical significance was assumed at a p-value of less than 0.5.

Results: Only 58% of the nurses in our study possessed adequate knowledge of diabetic foot ulcers. The mean score of knowledge was 74.9 (±9.5). Macdonald's standard criteria for learning outcomes was used to score the knowledge levels of study sample. Nurses performed best in the domain of ulcer care with 68.1% of the participants possessing good knowledge of the topic. The overall attitude of nurses towards patients with diabetic ulcers was positive.

Conclusion: This study identified practical yet reversible deficiencies in nurses knowledge and highlights the significance of evidence-based practice. Poor knowledge can mask quality of healthcare status despite owning positive attitudes. Hence, a dynamic and pragmatic approach for the nursing curricula revision across the country should be run to support tertiary care hospitals framework for rendering multi-disciplinary plan of action and allowing the nurses to update their knowledge.

Keywords: diabetic foot ulcers, nursing care, wound management, evidence based practice.

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INTRODUCTION:

About one in every 11 people in Pakistan is suffering from Diabetes Mellitus and its complications with a global burden of around 425 million). [1]. The manifestation of the disease is diverse with an array of micro and macro vascular complications resulting from suboptimal to poor glycemic control such as peripheral and autonomic neuropathy, coronary artery disease, cerebrovascular accidents, peripheral vascular disease, chronic kidney disease and blindness etc. [2]. Unfortunately, the peripheral neuropathy (PN) and peripheral vascular disease (PVD) have evolved in approx. 10% of the newly diagnosed patients leading to the events of diabetic foot [3]. Diabetic foot is defined as an area of dead skin and underlying tissue leading to gangrene formation in the distal parts of the lower limbs [4]. The prevalence of diabetes is increasing exponentially with a conversion rate of 15% during the lifetime [3].

Diabetic foot is a leading cause of and repeated hospital visits and admissions amongst diabetics, some of them warranting amputation as a lifesaving procedure having psycho-socioeconomic implications. [5]. It is necessary for patients, caregivers and healthcare workers to have an updated knowledge of foot care to restore structure and function. Nurses should be able to identify, notify and provide knowledge regarding foot care plan to the patients to prevent the progression of the ulcer. This approach consists of explaining the patient with risk factors and standard guidelines and recommended techniques [6]. Stress should be placed on the ideal role of nurses in a healthcare team, and they should be engaged in comprehensive glycemic control approaches, dietary counselling and wound management programs [7]. The development of any such practical educational program would require an assessment of the current knowledge of nurses and rating their orientation about diabetic foot among nurses in the healthcare setup.

Multiple studies have been conducted to evaluate the knowledge of foot care amongst diabetics in Pakistan [8]. However, the data is scarce about wound-care management among healthcare workers especially the nurses. Hence, the aim of our study is to evaluate the knowledge, attitudes, and practices of nurses towards the diabetic foot management at a tertiary care hospital of Pakistan.

MATERIALS AND METHODS:

This is a cross-sectional descriptive study conducted at Lahore General Hospital during June 2018 to January 2019. It was approved by the ethical review committee

of the hospital. 300 nurses were inducted for the study. Verbal and informed written consent was obtained from all the participants. Confidentiality and privacy was ensured at every step with a 100% turn out rate.

The inclusion criteria agreed upon was that all nurses should be working in surgical wards and OPDS and are directly involved in diabetic ulcer management. Nurses should be possessing at least one year of relevant clinical experience.

Non-probability convenience sampling was used and a self-structured questionnaire was designed to evaluate the knowledge, attitudes, and practices of nurses regarding diabetic foot care. The questionnaire was framed in bilingual format (English and Urdu for convenience of interpretation). The validity of the study tool was verified by senior faculty members for their valuable input and feedback. A pilot study was also launched prior to the commencement of official project for orientation. On ground logistic and technical support was provided for reassurance.

The questionnaire consisted of three parts, identical to the one used by our counterparts in Sri Lanka [9]. The first section comprised of the sociodemographic data. The second section of the study tool was drafted to check the level of knowledge possessed by nurses about diabetic foot ulcers and the treatment plan. The multiple-choice format has greater validity over its open-ended style. Hence, the knowledge header entailed 15 items focusing on risk factors, descriptions, and the management of diabetic foot ulcers. The three options provided for each question were "Yes," "No," and "I do not know," The scoring criteria worked as follows: 1 mark was awarded for each correct response whereas incorrect answers and "I do not know" were scored 0. A mean score was calculated using the results and the level of knowledge divided into two groups. Nurses who have a total score equal to or greater than the mean score for knowledge were declared to have good knowledge about diabetic foot care. In contrast, poor knowledge was presumed as a score lesser than the mean value for knowledge.

The attitudes of nurses pertaining to diabetic foot care were gauged in the third section of the campaign. This portion consisted of 10 items, derived from the study conducted by Kumarasinghe *et al.* [9]. The basic themes covered in this section orbit around the risk assessment perception of diabetic foot ulcers, their clinical staging, and the professional interest shown by nurses towards diabetic foot care. A shift to the 5-point Likert scale was opted for this section. An assessment of attitudes on a wider scale is facilitated more by the

Likert system as compared to the multiple-choice format offering dichotomous responses.

After data collection was over, it was analyzed by the SPSS version 19 IBM Corp. Armonk, NY, US.

RESULTS:

The percentage of female participants in the study was exceptionally high as compared to their male

counterparts and accounted for 92.6% of the study population. The highest percentage of correct responses to a question (95%) were regarding the necessity to clean infected wounds. The demographic characteristics of the nurses are shown in Table 1. Most of the nurses were employed in surgical intensive care units (74.6%). Of the nurses interviewed, 44.0 % were less than or equal to 30 years of age.

Table 1: Socioeconomic Data of Nurses

Variables	N	%
Gender		
Female	278	92.6
Male	22	7.3
Age		
≤30	132	44.0
31–40	76	25.3
41–50	52	17.3
51–60	40	13.3
Qualification		
Diploma	212	70.6
Post-basic diploma	40	13.3
Degree	48	16.0
Nursing experience (years)		
≤5	120	40.0
6–10	72	24.0
11–15	38	12.6
16–20	28	9.3
>20	42	14.0
Wound care experience (years)		
≤5	155	51.6
6–10	65	21.6
11–15	35	11.6
16–20	28	9.3
>20	17	5.6
Formal training in wound care		
Yes	48	16.0
No	252	84.0
Undertaking any advance courses?		
No	156	52.0
In-service education	64	21.3
In a degree programme	50	16.6
Other	30	10.0

Table 2: Frequency and Percentage Distribution Knowledge of Nurses Regarding Diabetic Foot Ulcer

Item	Correct%	Incorrect%	Don'tknow%
Peripheral sensory loss is the main culprit factor for diabetic ulcers (True)	61.0	27.0	12.0
Sensory neuropathy results in unnoticed skin damages leading to the ulcer formation (True)	93.0	4.0	3.0
Autonomic neuropathy is associated with dry and broken skin which predisposes to ulcer formation (True)	84.0	13.0	3.0
Diabetic neuropathic ulcers are typically found on weight-bearing points of the foot (True)	72.0	18.0	10.0
Diabetic ischemic ulcers are less painful than diabetic neuropathic ulcers (False)	74.0	20.5	.5.5
Neuropathy can be excluded if the foot skin is cool and pulses are absent (False)	77.0	15.0	8.0
The risk of amputation is higher when diabetic foot ulcer is associated with limb ischemia (True)	41.0	50.0	9.0
Presence of slough is not an indication of infection in diabetic ulcers (False)	88.0	4.0	8.0
Presence of osteomyelitis impairs the healing of diabetic ulcers (True)	82.0	10.0	8.0
Wound healing progress is unsatisfactory if the wound bed appears pink (False)	86.0	7.0	7.0
Avoid weight bearing should be advised to facilitate ulcer healing (True)	37.0	50.0	13.0
Hyperbaric oxygen therapy is recommended for ulcer healing even in a well-perfused foot (False)	92.0	4.0	4.0
Infected, pus discharging wounds should be toileted daily (True)	95.0	1.0	4.0
Iodine dressings are effective for wounds with clinical signs of infection (True)	76.0	22.0	2.0
Water based gels and dressings are useful to rehydrate the wound bed and control the moisture in wounds (True)	80.0	12.0	10.0

Table 3 depicts the association between knowledge and demographic features. There was a significant association between nurses' knowledge and their nursing (0.006) and wound care experiences (0.007). It is interesting to note that only the time period of one to five years was significant for both domains.

Significant associations were also observed between nurses' knowledge, receiving wound care training (0.002), and working in outpatient departments

(0.021). However, we observed no statistically significant associations between knowledge and gender, age and professional qualifications. A substantial proportion of the nurses identified their knowledge as satisfactory (70.5%) whereas only 0.5% of them thought their knowledge was poor. Of these, 31.0% believed they possessed a good knowledge of diabetic ulcer disease. Only 3% of nurses, on the other hand, rated their knowledge as excellent.

Table 3: Factors Affecting with Nurses Knowledge

Characteristic	N	Median	IQR	P-value
Sex				
Female	278	76.0	14.2	0.352
Male	22	77.0	23.7	
Age				
≤30 years	194	76.0	21.0	0.062
>30 years	106	78.0	16.4	
Professional qualification				
Diploma	210	78.0	16.4	0.352
Degree	90	74.0	24.2	
Nursing experience				
1–5 years	191	72.0	21.0	0.007*
> 5 years	109	83.0	16.4	
Wound care experience				
1–5 years	173	73.0	21.0	0.006*
>5 years	127	82.0	16.4	
Formal Wound care training				
Yes	62	88.0	21.0	0.003*
No	238	71.0	21.0	
Hospital unit				
OPD	76	72.0	20.0	0.032*
Surgical Wards/ICUs	224	83.0	14.2	

Educational activities (76.4%) and knowledge sharing with peers (82.6%) were by far the most popular methods utilized by our study population to improve their knowledge. The highest and lowest possible scores on the attitude scale were 10 and 50, respectively. Our study, however, manifested a range of attitude scores from 12 to 48. An analysis of the median score (38, range 2148) for the study revealed

that the overall attitude of nurses towards patients with diabetic ulcers was positive. Table 4 shows a detailed assessment of individual attitudes and highlights that a majority of the nurses prioritized ulcer prevention over treatment (85.6%), gave diabetic ulcer care a high clinical priority (92.8%), and considered it their responsibility to advise patients on avoiding re-ulceration (87.6%).

Table 4: Attitude of Nurses Regarding Diabetic Ulcer Care

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	33 (11.0)	27 (9.0)	15 (5.0)	126(42)	99 (33)
2. I do not think it is necessary to assess diabetic ulcers regularly	12(4.0)	12(4.0)	6 (2.0)	196(65.3)	74 (24.6)
3. Diabetic ulcer care is too time-consuming for me to carry out	7(2.3)	33(11.0)	60 (2.0)	125(41.6)	75 (25.0)
4. In comparison with other areas of nursing care, diabetic ulcer care is a low priority task for me	7(2.3)	12 (4.0)	74 (24.6)	110(36.6)	97(32.3)
5. If I have the opportunity, I would like to avoid caring for diabetic ulcers	10 (3.3)	7 (2.3)	10 (3.3)	82 (27.3)	191 (63.6)
6. I do not have time to advise each patient individually on how to look after their ulcers	7(2.3)	26 (8.6)	54 (18.0)	128(42.6)	85 (28.3)
7. It is not my responsibility to educate patients with diabetic ulcers on how to reduce re-ulceration	2 (0.6)	19(6.3)	31(10.3)	154(51.3)	84 (28.0)
8. I cannot think about pain when cleaning diabetic ulcers	9(3.0)	91(30.3)	30 (10.0)	121(40.3)	49(16.3)
9. I do not like to care for diabetic ulcers in my practice	0 (0.0)	40(13.3)	60 (20.0)	154(51.3)	46 (15.3)
10. I do not get satisfaction by caring for diabetic ulcers	0 (0.0)	0 (0.0)	25 (8.3)	157(52.3)	118 (39.3)

DISCUSSION:

A thorough literature search on diabetic foot ulcers revealed that there is a paucity of local and global data pertaining to knowledge of healthcare workers and their attitudes. A study conducted in a Sri Lankan clinical setting coincides with our observation. Our data revealed a large gender gap, with females compromising the major bulk of their healthcare participants. This pattern of gender disparity has been observed in multiple nursing studies worldwide [10]. Furthermore, approximately 56% of the nurses were older than 30 years of age. As aging ensues despite being experienced are prone to develop various disorders because of work burden [11]. Our data indicate that although 60% of the nurses possessed wound care experience of more than 5 years, and only 20.6% of the sample population had received formal wound care training. A similar finding was reported by a Swedish study where nurses lacked comprehensive wound care training despite a decade of professional

experience [12]. A study in Ethiopia revealed that 91.1% of participants lacked any wound care training [10]. 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 in line with a study conducted in Sri Lanka, which reported similar knowledge scores [10].

Additionally, a survey in Bangladesh revealed that the mean knowledge of nurses concerning the prevention of diabetic foot ulcers was only 52.60% [15]. The current level of knowledge revealed by our study is unsatisfactory because the nurses are employed in tertiary care hospitals and are expected to possess comprehensive knowledge [10]. 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 around updated information pertaining to ulcer care [13]. 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 [16]. A question aimed at evaluating risk assessment for amputations in DFUs was answered incorrectly by 50% of the nurses. A poor knowledge of risk assessment was also observed in a Nigerian study where 73% of participants had incorrect responses [13]. This is in contrast to a multicenter study conducted in Sweden, which reported high scores for risk assessments in pressure ulcers [12]. It is eminent that nurses specialize in evidence-based practice to comprehensively 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 [15].

Our study found a significant association between nurses' knowledge and their wound care and nursing experiences, wound care training, and work units (surgical intensive care units (ICUs) and outpatient departments (OPDs)). Surprisingly, our study found that nurses' knowledge was significantly correlated with a professional and wound care experience of five years or less. This finding coincides with a study conducted at Brazilian University Hospital, which revealed that nurses with greater years of experience had lower knowledge scores [17]. A study at the University of Copenhagen found no statistical link between nurses' knowledge and the duration of their

professional experiences [18]. However, there have been various studies that report contrasting findings and establish a significant association between nurses' knowledge and years of experience [13]. 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 [16]. 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 [19]. Multiple studies have reported a significant link between wound care training and the knowledge possessed by nurses [10]. An Ethiopian study on pressure ulcer prevention observed higher levels of knowledge in nurses who had received formal wound care training [10]. A possible explanation could be greater clinical exposure acquired through training, which facilitates learning. Our study found no statistical significance between nurses' knowledge and gender, professional qualifications, and age.

Various nursing studies have explored nurses' self-perception of knowledge and the common sources used by them to enhance their knowledge. In our study, 70.5 % of the nurses identified their knowledge as satisfactory. This finding coincides with a similar study on Sri Lankan nurses [10]. 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 [19]. 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 [19]. 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 [20].

A multitude of studies have observed positive attitudes among nurses towards ulcer care and the data in our study brings us to the same conclusion [10]. It has been established that attitude is an influential factor in

determining the intention of an individual [16]. A positive attitude, for instance, can markedly increase preventative measures for a disease [21]. 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 [16]. 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 [23]. In our study, nurses' attitudes were not influenced by their wound care experiences. This finding coincides with the results of the study conducted by Beeckman et al. where nurses' attitudes were unaffected by formal wound care training [23]. This observation demonstrates the limited utility of current educational methods to influence workplace attitudes and, ultimately, practice. Unfortunately, only 5% of nurses showed keen interest in pursuing diabetic foot research. The campaign of evidence-based learning and practice should be further highlighted to foster the clinical education ecosystem of Pakistan.

CONCLUSIONS:

This study highlights that nurses possess lack of sufficient operational knowledge regarding diabetic ulcer care despite having positive attitude. Formal wound care training and work experiences demonstrated a positive feedback for enhancing the clinical knowledge and orientation. Hence, a dynamic and pragmatic approach for the nursing curricula revision across the country should be run to support tertiary care hospitals framework for rendering multi-disciplinary plan of action and allowing the nurses to update their knowledge. Evidence-based clinical practice is the backbone of research. Nurses should be made aware of the importance of research in their clinical practice and be provided with opportunities to undertake research activities solemnly.

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