

Knowledge and attitude of nurses towards diabetic foot care in a secondary health care centre in Malaysia

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ABSTRACT

Introduction: Nurses play a vital role in the care and prevention of ulcers in patients with diabetic foot. Patient education, prevention of ulcers and rehabilitation are some of the vital aspects that nurses provide on a daily basis. Thus, good knowledge and attitude of nurses towards diabetic foot ulcers and its care will ensure better patient care.

Objectives: The aim is to study the level of knowledge and attitude of nurses towards diabetic foot ulcers and its care in Hospital Segamat, Malaysia.

Methods: A validated questionnaire was used between February 2019 to May 2019 covering area such as demography, predisposing factors of ulcer formation, characteristics of ulcers, complications of ulcers, and attitude towards diabetic foot care.

Results: A total of 101 nurses took part and 57% of the participants scored poorly in the knowledge section of the questionnaire. In all 72% had scored poorly when asked regarding complications of diabetic foot ulcers; 49.5% of the nurses had positive attitude towards diabetic foot care; and 79.3% thought that care for diabetic foot ulcer is time-consuming. Majority of them think that their colleagues are the main source of information. All demographic variables were deemed to be confounders with the knowledge and attitude of nurses towards diabetic foot ulcers and its care. **Conclusions:** Nurses in this centre had poor knowledge towards diabetic foot ulcers and its care. None of the variable studied were correlated with the level know knowledge. Good or poor knowledge of nurses does not correspond equally to good or poor attitude towards diabetic foot ulcers care. More frequent formal training of diabetic foot care would be needed to ensure better knowledge.

KEY WORDS:

Diabetic foot care, nurses knowledge, nurses attitude

INTRODUCTION

The prevalence of diabetes mellitus has presently reached global

epidemic proportions.¹ Recent studies conducted in Malaysia shows that the occurrence of a population with diabetes among rural and semi-urban regions range between 7% to 20.3%.^{1,2} Patients with poor control of their diabetes are prone to experience diabetic complications.^{3,4} Diabetic foot ulcers is one of the most common diabetic complications found today. These ulcers can often lead to infection, gangrene, limb amputation and even death.⁵ Studies have shown that a diabetic amputee has a 50% risk of amputation of the other lower limb during the first 2 years and a mortality rate of up to 50% during the first 3 years after a lower limb amputation.^{6,7}

Therefore, there is an increasing need for nursing intervention in the care of diabetic patients. Nurses play a major role in diabetic foot care, which include health education, patient care, prevention of ulcers and rehabilitation.⁸ Studies show that poor knowledge on diabetic foot care among patients is directly related to lack of nursing intervention.⁹⁻¹¹ It goes without saying that it is of utmost importance for nurses to have adequate and up-to-date knowledge to provide better health services. Research has been done in several countries around the world to study the knowledge the diabetic foot care among nurses and also their attitude towards the disease.¹²⁻¹⁴ This level of knowledge will reflect on the dissemination of correct information to the patients and further ensure correct practice in patient care.¹²

The main objective of this study is to investigate the extent of knowledge and attitude of nurses in secondary healthcare centres in regards to diabetic foot ulcers and diabetic foot care. The secondary objective is the relationship between other contributing factors such as age, education qualification, the field of practice, experience, duration since last diabetic foot care course and the knowledge and attitude of nurses towards diabetic foot ulcer.

METHODOLOGY

This was a cross-sectional study conducted in a secondary health care hospital, Hospital Segamat (HS) in Malaysia between the 1st February 2019 to 31st May 2019. All nurses working in HS were encouraged to take part in the study. Exclusion criteria included nurses who were unable or refused to give consent.

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A validated questionnaire was used to assess the knowledge and attitude of nurses towards diabetic foot care.^{12,15} As medical education for nursing is conducted in the English Language in this country, the English version of the questionnaire was distributed without the need for translation. The questionnaire comprised 3 sections. The first section consisted of questions regarding the demography of the survey participants such as age, gender, professional qualifications, place of work, experience, whether participants take part in the management of diabetic foot ulcers, duration since the last training session and the sources used to update knowledge were documented. The second section consisted of 15 questions designed to assess the knowledge possessed by the participants and the percentage scored was categorised. These 15 questions included areas such as predisposing factors for ulcer formation, characteristics of ulcers, complications of ulcers and diabetic ulcer care. A “good knowledge” rating was obtained when the knowledge score was more than or the same as the mean and a “poor knowledge” rating was when the score was less than the mean.¹⁰ The third section consisted of 10 questions assessing the attitudes towards diabetic foot care of nurses. Each question was scored from 1 to 5 points. A positive attitude was obtained when the participants obtained subject score more than or same with the median score and a negative attitude was when the subject score was less.

All voluntary participants were given the self-administered questions. Informed consent was taken from them prior to answering the questionnaire. The completed questionnaires were collected by the investigators on the same day it was distributed. All data collection was kept anonymous to maintain confidentiality. The nurses working in medical-related departments were from internal medicine, psychiatry, obstetrics and gynaecology, paediatrics, pathology and radiology. Nurses working in the surgical related departments are from general surgery, orthopaedics, emergency, anaesthesiology, otorhinolaryngology, ophthalmology, forensic medicine, dental and maxillofacial unit. Data collected was analysed using SPSS version 21.0.

The approval to conduct this study had been given by the Medical Research and Ethics committee of the Malaysian Health Ministry (Kementerian Kesihatan Malaysia).

RESULTS

Characteristics of participants

There were 101 nurses who completed the questionnaire with a majority being female medical personnel (n=87, 86.1%) and the other males (n=14, 13.9%). In all 33.7% of the nurses work in the medical-related departments, while 58.4% of them worked in the surgical-related departments. The remaining 7.9% worked in other non-clinical departments of the hospital. In terms of qualification, a majority of the nurses had obtained diploma (n=65, 64.4%), whilst the rest obtained post-basic training (n=27, 26.7%). Up to 43.6% of the participating nurses had working experience of more than 10 years. In all 52% of them do not take part in diabetic foot care services. However, 50.5% of the nurses had undergone training on diabetic foot care in the past 1 year; and 40.5% of the nurses updated their knowledge

Table I: Demographic distribution of participating nurses

Variables	n (%) N=101
Gender	
Total	101 (100)
Female	87(86.1)
Male	14(13.9)
Department	
Medical-related	34(33.7)
Surgical-related	59(58.4)
Others	8(7.9)
Qualifications	
Certificate	3(3.0)
Degree	5(5.0)
Diploma	65(64.4)
Post-basic	27(26.6)
Years of Service	
< 2 years	4(4.0)
2-5 years	25(24.8)
5-8 years	28(27.7)
>10 years	44(43.6)
Involvement in DFU care	
No	52(51.5)
Yes	49(48.5)
Last formal training on diabetic foot ulcers and diabetic foot care	
< 1 year	51(50.5)
1-2 years	16(15.8)
2-3 years	17(16.8)
>3 years	17(16.8)
Main source of knowledge updates	
Colleagues	41(40.5)
Books	18(17.8)
Internet	28(27.8)
Seniors	14(13.9)

through colleagues while 28% updated their knowledge on diabetic foot care through the internet. The above is shown in Table I below.

Participants' knowledge

According to the data collected, the mean score was 66.6% and more than half of the participants (57%) had poor knowledge on diabetic foot care. The range of the total score obtained ranged from 33.3 to 86.6 on a scale of 0-100, and none of the participants scored full marks on this questionnaire. Only 23.8% of the nurses knew that diabetic ischemic ulcers were more painful than a diabetic neuropathic ulcer (Table II). The data shows that the majority (n=72, 71.3%) of the nurses scored poorly when tested on complications of diabetic foot ulcers (Table III).

Attitude of participants

A total of 49.5% of the nurses had a positive attitude towards diabetic foot ulcer management. The total score for this section ranged from 26 to 49 on a scale of 0-50 with a median score of 38. Results from this questionnaire suggested that 79.3% of these nurses considered the management of diabetic foot ulcer time-consuming. On the other hand, 95% of participants believed diabetic foot ulcers need regular assessment and the majority believed that it is their duty to educate patients to reduce recurrence of ulceration (95%) as shown in Table IV.

Table II: Results of the questionnaire regarding knowledge of nurses on diabetic foot care

Questions	Correct (%)	Incorrect (%)
1. Neuropathy is a predominant factor responsible for diabetic ulcers	85.1	14.9
2. Sensory neuropathy results in unnoticed skin damages which lead to the formation of ulcers.	93.1	6.9
3. Autonomic neuropathy is associated with dry skin which predisposes to ulcer formation.	81.2	18.8
4. Diabetic neuropathic ulcers are typically found on weight bearing areas of the foot.	86.1	13.9
5. Diabetic ischemic ulcers are less painful than diabetic neuropathic ulcers.	23.8	76.2
6. Neuropathy can be excluded if the foot skin is cool and pulses are absent.	83.2	16.8
7. The risk of amputation is higher when diabetic foot ulcer is associated with limb ischemia.	97.0	3.0
8. Presence of slough is not an indication of infection in diabetic ulcers	83.2	16.8
9. Presence of osteomyelitis impairs healing of diabetic ulcers.	65.3	34.7
10. Wound healing progress is unsatisfactory if the wound bed appears pink.	58.4	41.6
11. Mechanical off-loading should be advised to facilitate ulcer healing.	76.2	23.8
12. Hyperbaric oxygen therapy is recommended for ulcer healing even in a well-perfused foot.	60.4	39.6
13. Infected, highly exuding wounds should be cleaned daily.	96.0	4.0
14. Iodine dressings are effective for wounds with clinical signs of infection.	45.5	54.5
15. Hydrogel dressings are useful to rehydrate the wound bed and control the moisture in wounds.	87.1	12.9

Table III: Analysis of results of the questionnaire on areas regarding diabetic foot ulcer

Variables	Good knowledge	Poor knowledge
	n (%)	n (%)
Predisposing factors for ulcer formation	68 (67.3)	33 (32.7)
Characteristics of ulcer	58 (57.4)	43 (42.6)
Complications of ulcer	29 (28.7)	72 (71.3)
Diabetic foot care	67 (66.3)	34 (33.7)

Table IV: Questionnaire on attitude of participants towards diabetic foot care

Questions	Strongly agree n (%)	Agree n (%)	Neither agree or disagree n (%)	Disagree n (%)	Strongly disagree n (%)
1. I think diabetic ulcer treatment is more important than ulcer prevention	3 (3.0)	15 (14.9)	4 (4.0)	61 (60.4)	18 (17.8)
2. I do not think it is necessary to assess diabetic ulcers regularly.	0	1 (1.0)	4 (4.0)	58 (57.4)	38 (37.6)
3. Diabetic ulcer care is too time consuming for me to carry out.	5 (5.0)	75 (74.3)	9 (8.9)	10 (9.9)	2 (2.0)
4. In comparison with other areas of nursing care, diabetic ulcer care is a low priority task for me.	1 (1.0)	4 (4.0)	9 (8.9)	62 (61.4)	25 (24.8)
5. If I have the opportunity, I would like to avoid caring for diabetic ulcers.	1 (1.0)	7 (6.9)	5 (5.0)	54 (53.5)	34 (33.7)
6. I do not have time to advise each patient individually on how to look after their ulcers.	0	5 (5.0)	4 (4.0)	57 (56.4)	35 (34.7)
7. It is not my responsibility to educate patients with diabetic ulcers on how to reduce re-ulceration.	0	2 (2.0)	3 (3.0)	49 (48.5)	47 (46.5)
8. I cannot think about pain when cleaning diabetic ulcers.	0	7 (6.9)	3 (3.0)	51 (50.5)	40 (39.6)
9. I do not like to care for diabetic ulcers in my practice.	0	8 (7.9)	12 (11.9)	43 (42.6)	38 (37.6)
10. I do not get satisfaction by caring for diabetic ulcers.	1 (1.0)	15 (14.9)	23 (22.8)	46 (45.5)	16 (15.8)

Table V: Cross-tabulation between knowledge and attitude categories of participants

		Attitude		Total	
		Below median of 38 (Poor Attitude)	Above median of 38 (Good Attitude)		
Knowledge	Below mean of 10 (Poor Knowledge)	n (%)	30 (52.6%)	27 (47.4%)	57 (100%)
	Above and equal to mean of 10 (Good Knowledge)	n (%)	21 (47.7%)	23 (52.3%)	44 (100%)
	Total	n (%)	51 (50.5%)	50 (49.5%)	101 (100%)

P-value=0.63

Analytical statistics

Table V above shows that good or poor knowledge does not correspond to having an equally good or poor attitude for treating diabetic foot ulcers. A chi-square test performed yielded a p-value of 0.63 affirming the previous statement.

Regression analysis

A regression analysis was conducted (binary logistic regression) with both the outcomes of knowledge and attitude (done separately).

A binary logistic regression was conducted after the assumptions proved favourable. There was no statistical significance on the demographic characteristics with the knowledge and attitude of nurses. All demographic variables were deemed to be confounders with the knowledge and attitude of nurses towards diabetic foot ulcer care.

DISCUSSION

In our centre a majority of the nurses frequently rotated to all the medical, surgical and support group departments. Thus, only half of the participating nurses in this study were at present involved in diabetic foot ulcer management. This is different from other studies where the cohorts consisted mainly of surgical-based nurses who were actively involved in diabetic foot ulcer care and wound management.^{12,13,15}

More than 57% of nurses scored unsatisfactorily in the section on knowledge in the questionnaire. This finding is similar to the findings in other studies done around the world.^{12,13,15-18} A majority of these studies attributed the poor knowledge of nurses on diabetic foot ulcers due to limited access of formal training and educational seminars.¹⁷⁻²⁰ This is reflected in the chosen centre for this study as well, with only 50.5% of the nurses having undergone formal training on diabetic foot ulcers and diabetic foot care in the earlier one year. Besides the infrequent formal training and courses, the lack of manpower and constant increasing workload also contributed to the lack of training for nurses. Studies have shown that specialised wound care training has improve wound care knowledge and practice.²¹ A more interactive form of training and a more frequent and consistent training schedule could further enhance knowledge among nurses.

On further examination, the participating nurses scored poorly on the characteristics of ulcers and identification of diabetic foot complications similar to findings from other studies.^{17-18,22-24} Knowledge on complications of diabetic foot ulcers is crucial in detecting early stages. Even though clinical examinations are frequently carried out by doctors, nurses with good clinical knowledge are able to detect complications earlier and ensure timely referral to the surgical disciplines.^{26,27} Nurses in the surveyed centre only scored moderately in knowledge on diabetic foot care. Other studies have reported suboptimal knowledge on diabetic foot care.^{12,13,15-18}

In this study none of the investigated factors have proven to be statistically significant in influencing the level of knowledge of the nurses. Thus, all demographic data are deemed to be important confounders of knowledge of nurses'. Some studies show that working experience does strongly

influence the level of knowledge.^{16-18,20,25} In contrast, there was no correlation found between the years of working experience and the level of knowledge. This finding is similar with a few studies done in Bangladesh and Denmark.^{13,19} The authors believe that this possibly could be due to the presence of formal wound care training which successfully closes the gap between more experienced nurses and newer nurses.

A majority of the nurses are of the opinion that information and updates were best obtained from their colleagues as compared to using the internet or by attending seminars. Knowledge enhancement through knowledge sharing between colleagues seems to be the most popular way in obtaining up-to-date information about diabetic foot ulcer and diabetic foot care. Similar findings were found in various studies to support this.^{15,19,28,29}

Attitude towards chronic ulcer care was positive similar to the other studies.¹⁵ In this study, it was found that there is no correlation between the level of knowledge and attitude towards chronic ulcer care. Indirectly, it could be deduced that a majority of the participating nurses were helpful and keen to take care of diabetic foot ulcers. However, it is argued that positive attitudes are not adequate to change the practice.³⁰

LIMITATIONS

One of the main limitations is the sample was deemed to be small because of the chosen hospital which is a small institution and diabetic foot care is a field of work managed by all. A single study site with limited sample size does not represent the nursing population in Malaysia. A larger multicentre sample could always be beneficial. Factors such as lack of time and staff should be considered in assessing the practice of nurses during ulcer care. The sample was random and the knowledge of nurses working solely with the paediatric age group might have lowered the level of knowledge and practice in diabetic foot care found in this study. As the questionnaire was in English language, there is a possibility that nurses with poor command of English may have difficulty in understanding the questions fully. The authors would like to thank the Director-General of Health Malaysia for permission to publish this paper.

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CONFLICT OF INTEREST

This study has no conflict of interest.

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