

## Nurses' Knowledge toward Nursing Care of Diabetic Foot Ulcers at Diabetic Center in Merjan Medical City

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### Abstract

**Background:** 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. 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. Therefore, there is an increasing need for nursing intervention in the care of diabetic patients. **Design Of The Study:** A descriptive study design has carried out to nurses' knowledge toward nursing care of diabetic foot ulcers at diabetic center in Merjan medical city. The study had started from October 15<sup>th</sup> of 2023 to April 1<sup>st</sup> of 2024. **Setting Of The Study:** In order to obtain more specific and precise and accurate data, the study was conducted at diabetic center in Merjan Medical City the designated site for data collection. **Instrument Of The Study:** Through an extensive review of relevant literature, the study instrument is constructed for the purpose of the study. It is comprised of two parts and the overall items included in these questionnaires are (20) items **Sample Of The Study:** A purposive sampling technique that is non – probability of (50) nurses who working in diabetic center at the time of the study period and met the studying criteria and have a prior agreement to participate who were selected (5) nurses for pilot studies and had been excluded. **Data Collection:** Data has been collected through the utilization of the developed questionnaire through using interview technique of all available contacts that facilitate the access to the study sample. The duration of interview approximately (10-15) minutes. The data collection process was started from December 1<sup>st</sup> 2023 to January 1<sup>st</sup> 2024. **Conclusions:** Overall assessment level of overall assessment level nurses' knowledge toward diabetic foot ulcers in present study as a general is good level. **Recommendations:** Establishment plans of training and development for nursing staff to increase their knowledge, awareness, and skills about the nursing care which provided the patients with diabetic foot ulcers.

**Keywords:** Diabetic Foot Ulcers, Nurses' Knowledge

### Introduction:

Diabetes mellitus is a serious, long-term condition with a major effect on the lives and well-being of individuals, families, and cultures worldwide. It is among the top 10 causes of death in adults, and it estimated to have caused four million deaths globally in 2017. In 2017, global health expenditure on diabetes estimated to be USD 727 billion (American Diabetes Association, 2020).

Diabetes mellitus consider as one of the most common non- communicable diseases affecting people around the world. The International Diabetes Federation (IDF) estimated that 451 million people worldwide had diabetes in 2017 and the number is expected to rise to 693 million by 2045. Unfortunately, most people with diabetes live in low- and middle-income countries. Uncontrolled diabetes can lead to macrovascular and microvascular complications, including stroke, heart disease, blindness, renal failure, and lower limb amputation. In 2017 an estimated 5.0 million

deaths worldwide were directly caused by diabetes (Marathe et al., 2017).

The prevalence of diabetes mellitus has presently reached global epidemic proportions. Patients with poor control of their diabetes are prone to experience diabetic complications (Pitocco et al., 2019). 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. 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. Therefore, there is an increasing need for nursing intervention in the care of diabetic patients (Tolossa et al., 2020). Nurses play a major role in diabetic foot care, which include health education, patient care, prevention of ulcers and rehabilitation. Studies show that poor knowledge on diabetic foot care among patients is directly related to lack of nursing intervention. 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. This level of knowledge will reflect on the dissemination of correct information to the patients and further ensure correct practice in patient care<sup>(5)</sup>.

Diabetic foot as the most common cause of hospitalization in diabetic patients is one of health system concerns. So that most of the time of diabetes healthcare providers is allocated to the prevention and diagnosis of diabetic foot complications. In this regard, nurses as members of the diabetes care team not only need to be play their role in health care, public education, health system management, patient care and improving the quality of life, but also must attend in special training to use the latest instructions of diabetic foot care in order that provides the effective services to facilitate promote diabetic patients' health (Aalaa et al., . 2012 ). When patients are able to produce effective self-care, it shows that they have awareness about themselves and their disease conditions. The individual's internal and external circumstances are covered by self-care

and applicable information or awareness. The age, marital status, degree of education, and socioeconomic situation of an individual influence the maintenance and growth of self-care agency. The primary lifestyle adjustments in public health promotion include a nutritious diet, frequent exercise, and keeping a healthy body weight ( World Health Organization, 2012).

### Importance of the Study

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 (Kumarasinghe et al., 2018).

Previous studies have reported gaps in wound care knowledge of many healthcare professionals including nurses (Coetzee et al., 2010) . Broad areas in which knowledge deficits were identified include, positioning and staging of patients ( Chianca et asl., 2010), ulcer assessment documentation and knowledge on new wound dressing material ( Demarré et al., 2012). Studies carried out on nurses from different settings seem to show variations in wound care knowledge. Although knowledge on wound assessment and documentation are considered as important areas in continuity of care and improving healing rates, and in reducing wound care cost, these were found to be inadequate even among hospital nurses. Nurses were not aware of what tools to use and what exactly to document (Beekman et al., 2011).

### Methodology

This chapter describes the methodology that is used in the study it includes: the design of the study, settings, Study instruments, sample of the study, methods of data collection, and data analysis.

### Design of the Study:

A descriptive study design has carried out to nurses' knowledge toward nursing care of diabetic foot ulcers at diabetic center in Merjan medical city. The study had started from October 15<sup>th</sup>, 2023 to April 1<sup>st</sup>, 2024.

**Setting of the Study:**

In order to obtain more specific and precise and accurate data, the study was conducted at diabetic center in Merjan Medical City the designated site for data collection.

**Instrument of the Study:**

Through an extensive review of relevant literature, the study instrument is constructed for the purpose of the study. It is comprised of two parts and the overall items included in these questionnaires are (20) items

**Part1: Demographic Characteristics**

This part includes information concerning the socio-demographic characteristics of the impatiens of age, gender, level of education, and years of experience, development and training, and number of course (7) items.

**Part 2: nurses' knowledge toward nursing care of diabetic foot ulcers**

The questionnaire includes the following parts:

This part is comprised of (13) items.

**Sample of the Study:**

A purposive sampling technique that is non –probability of (50) nurses who working in diabetic center at the time of the study period and met the studying criteria and have a prior agreement to participate who were selected (5) nurses for pilot studies and had been excluded.

**Validity of the Instruments:**

The validity of the questionnaire was determined through a panel of (5) experts

The experts were asked to review the content and structure of the questionnaire to be appropriate in the measurement of the concept underlying the study as well as achieving the main objectives of the study.

The results of the validity by the experts

indicated that the questionnaire is clear, suitable, adequate, relevant, and valid. All the suggestions of the experts took into consideration with respect.

**Data Collection:**

Data has been collected through the utilization of the developed questionnaire through using interview technique of all available contacts that facilitate the access to the study sample. The duration of interview approximately (10-15) minutes.

The data collection process was started from December 1st 2023 to January 1<sup>st</sup> 2024.

**Statistical analysis**

Data were analyzed through the application of appropriate statistical methods by using statistical package of social sciences (SPSS) version 24 which suitable with study results, in order to analyze and evaluate the results of the present study, this statistical methods include:

**Descriptive Data Analysis:**

It was used for describing the results of the study variables by applying the following measurements:

**A - Frequencies (F) B percentage (%)**

$$\text{Percentage (\%)} = \frac{\text{Frequencies (F)}}{\text{Size of sample}} \times 100$$

C – Mean:

$$\bar{x} = \frac{\sum \epsilon fi}{n}$$

**Computation of Mean of Scores (MS):**

This computation is applied for the determination of item's significance of the study tool relative to each aspect. (Musa, 2007):

A mean of score is greater than (2.34) is considered high. Equal to (1.67-2.34) is considered moderate and less than (1.67) is considered low, it was computed as:

$$MS. = \frac{f_1*s_1 + f_2*s_2 + f_3*s_3}{n}$$

MS. = Mean of Score , f = frequency , s = score , n = sample size

### E- Graphical presentation by using:

#### -3 D bars chart

#### Inferential Data Analysis:

It was used to find out the significant relationships and variances between the study variables through the following method:

**Chi-Square Test:**  $\chi^2 = \sum(\text{Observed} - \text{Expected})^2 / \text{Expected}$

### Results

This chapter presents the findings of the data analysis systematically in tables in correspond with the objectives of the study as follows:

Table 4-1: Shows that the majority of the study sample age 41(82%) were between (23-28) year, in relation to gender the highest percentage of the study sample 31(62%) were male; on the other hand, the highest percentage of the sample 26(52 %) were diploma, and 32(64%) were share in training courses, concerning to number of training courses the result revealed that 18(32%) were having a zero training courses.

Figure 1 show that 39(78%) were having

(1-5) years of experience

Table 4-2: Shows that the lowest mean was 1.94 with the item 11 (The diabetic foot examination period is every month to verify that there are no cracks or changes in skin color, odor or redness), while a highest mean 2.90 with the items 4,10,11 (Adherence to appropriate diabetes treatment is very important for the healing rate of diabetic foot ulcers), (Advise the patient to wear wool socks in the winter and silk socks in the summer), and (Should be wash your feet daily and avoid soaking them for a long time in water).

Table 4-3 show that the majority of sample 33(66%) were having good level of nurses' knowledge toward nursing care of diabetic foot ulcers at diabetic center.

Figure 4-2 show that the majority of sample 66% were having good level of nurses' knowledge toward nursing care of diabetic foot ulcers at diabetic center.

Table 4-4: shows that there is a high significant relationship between overall nurses' knowledge toward nursing care of diabetic foot ulcers and their demographic data at  $p \leq 0.05$  such as (age, gender, educational level, years of experience and training course), while with (number of training courses) that there is a non-significant relationship with nurses' knowledge toward nursing care of diabetic foot ulcers at  $p \leq 0.05$ .

Table 4-1: Distribution of the Study Sample by their Demographic Data (N =50)

Demographical data	Ranking And Intervals	Frequency	Percentage %
Age/ year	23-28	41	82.0
	29-34	3	6.0
	35-40	2	4.0
	41-46	2	4.0
	47-52	2	4.0
	Total	50	100.0
Gender	Male	31	62.0
	Female	19	38.0
	Total	50	100
Educational level	Diploma	26	52.0
	Bachelor	24	48.0
Are you share in training courses	Total	50	100
	Yes	32	64.0
Number of training courses	No	18	36.0
	Total	50	100.0
	0	18	36.0
	1	13	26.0
	2	15	30.0
	3	1	2.0
	4	2	4.0
5	1	2.0	
Total	50	100.0	

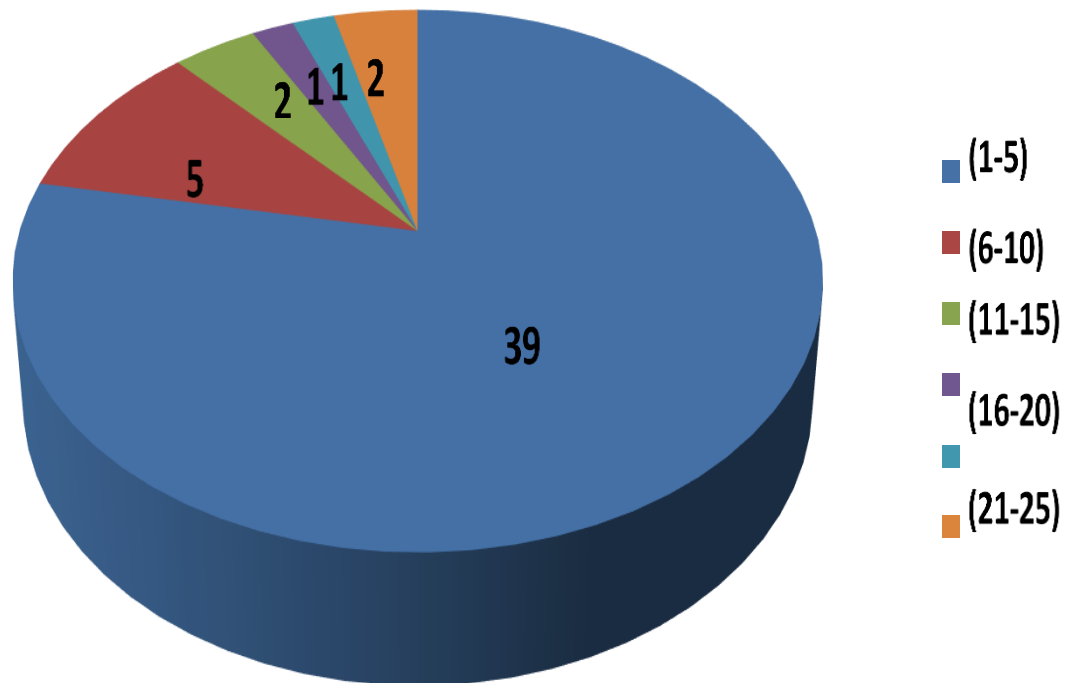


Figure 4-1: Years of experience

**Table 4-2: Distribution of Nurses' Knowledge toward Nursing Care of Diabetic Foot ulcers at Diabetic Center (N=50).**

No	Items	Don't know	Not sure	I know	M.S	Asses
1-	Foot ulcers of a diabetic patient are considered a serious, life-threatening disease	0	7	43	2.86	<b>High</b>
2-	It is possible for a patient with diabetic foot ulcers to recover completely if he receives appropriate nursing care	0	8	42	2.84	<b>High</b>
3-	Pain and loss of sensation in the foot of a diabetic foot patient are serious symptoms that are difficult to treat	0	16	34	2.68	<b>High</b>
4-	Adherence to appropriate diabetes treatment is very important for the healing rate of diabetic foot ulcers	0	5	45	2.90	<b>High</b>
5-	Following a healthy diet has an effective role in speeding up the healing of diabetic foot ulcers	0	17	33	2.66	<b>High</b>
6-	Smoking plays a role in reducing blood flow in the legs and feet, which leads to poor healing of diabetic foot ulcers	0	6	44	2.88	<b>High</b>
7-	Controlling blood pressure and cholesterol levels plays an important role in healing diabetic foot ulcers	0	10	40	2.80	<b>High</b>
8-	Exercise in the form of twisting and extending the toes several times a day	0	15	35	2.70	<b>High</b>
9-	Elastic stockings that restrict blood circulation should not be worn	0	7	43	2.86	<b>High</b>
10-	Advise the patient to wear wool socks in the winter and silk socks in the summer	0	5	45	2.90	<b>High</b>
11-	Should be wash your feet daily and avoid soaking them for a long time in water	1	3	46	2.90	<b>High</b>
12-	Oils and creams should be don't placed between the toes to protect them from infections	6	12	32	2.52	<b>High</b>
13-	The diabetic foot examination period is every month to verify that there are no cracks or changes in skin color, odor or redness	9	35	6	1.94	<b>Mod.</b>

**Low = (1-1.66), Moderate = (1.67-2.33), High = (2.34-3)**

**Table 4-3: Overall Assessment Level of Nurses' Knowledge toward Nursing Care of Diabetic Foot Ulcers at Diabetic Center (N= 50).**

Overall assessment	Frequency	Percentage %
Poor (13- 21.66)	1	2
Moderate (21.67- 30.33)	16	32
<b>Good (30.34- 39)</b>	<b>33</b>	<b>66</b>
Total	50	100

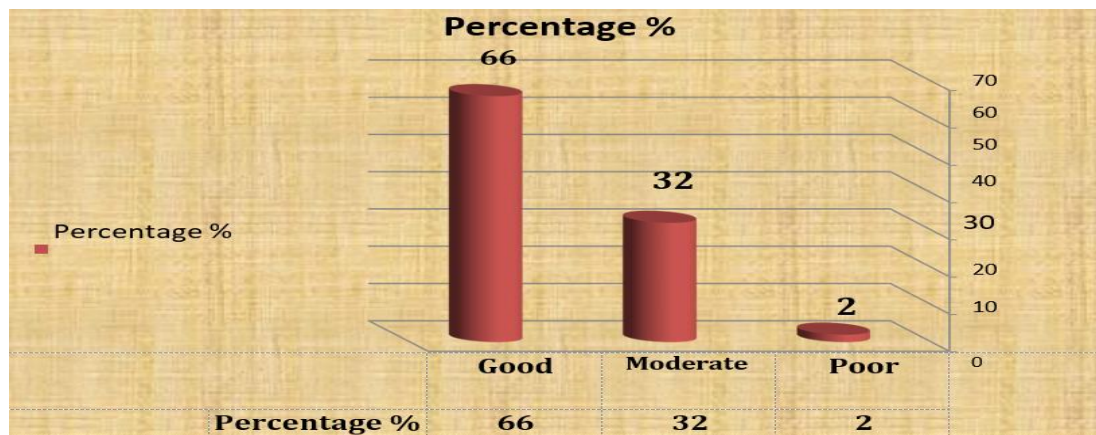


Figure 4-2: Overall assessment level of Nurses' Knowledge toward Nursing Care of Diabetic Foot Ulcers at Diabetic Center (N= 50).

Table 4-4: Association between Overall Nurses' Knowledge toward Nursing Care of Diabetic Foot Ulcers and their Demographic Data

Rating& intervals	Overall practice			Chi-Square Tests			
	Poor	Moderate	Good	X <sup>2</sup>	D.F	P value	Assessment
<b>Age\ year</b>							
23-28	1	15	25	13.213	8	0.004	Sig
29-34	0	1	2				
35-40	0	0	2				
41-46	0	0	2				
47-52	0	0	2				
<b>Total</b>	1	16	33			50	
<b>Gender</b>							
Male	0	11	20	3.219	2	0.0359	Sig.
Female	1	5	13				
<b>Total</b>	1	16	33			50	
<b>Educational level</b>							
Diploma	1	8	16	15.495	2	0.0215	Sig
Bachelor degree	0	8	17				
<b>Total</b>	1	16	33			50	
<b>Years of experience</b>							
1-5	1	15	23	3.836	10	0.028	Sig.
6-10	0	1	4				
11-15	0	0	2				
16-20	0	0	1				
21-25	0	0	1				
26-33	0	0	2				
<b>Total</b>	1	16	33			50	
<b>Are you share in training courses</b>							
Yes	0	9	23	15.854	2	0.019	Sig
No	1	7	10				
<b>Total</b>	1	16	33			50	
<b>Number of training courses</b>							
0	1	7	10	3.89	10	0.952	N.S
1	0	4	9				
2	0	4	11				
3	0	0	1				
4	0	1	1				
5	0	0	1				
<b>Total</b>	1	16	33			50	

X<sup>2</sup>= Chi-square ,Sig = significance, N.S = non significance, P value ≤ 0.05

## Discussion

This chapter presents a systematically designed interpretation and reasonably derived discussion of the results reported in chapter four. The interpretation of the results in this chapter are supported by available related studies.

### Overall Assessment Level of Nurses' Knowledge toward Nursing Care of Diabetic Foot Ulcers at Diabetic Center:

In table 4-3 and figure 4-2, show that the majority of sample 33(66%) were having good level of nurses' knowledge toward nursing care of diabetic foot ulcers at diabetic center. This study agree with results of previous study done by Mersal at Ain Shams University in Egypt, which refers that good level of nurses' knowledge toward diabetic foot care (Mersal et al., 2013).

### Distribution of the Study Sample by their Demographic Data:

In table 4-1: Shows that the majority of the study sample age 41(82%) were between (23-28) year, in relation to gender the highest percentage of the study sample 31(62%) were male; on the other hand, the highest percentage of the sample 26(52%) were diploma, and 32(64%) were share in training courses, concerning to number of training courses the result revealed that 18(32%) were having a zero training courses. Figure 4-1 show that 39(78%) were having (1-5) years of experience. This study similar to results of previous study done by Al-Jabouri ( Al Jabouri et al., 2022) in Iraq.

### Distribution of Nurses' Knowledge toward Nursing Care of Diabetic Foot ulcers at Diabetic Center

Table 4-2: Shows that the lowest mean was 1.94 with the item 11 (The diabetic foot examination period is every month to verify that there are no cracks or changes in skin color, odor or redness), while a highest mean 2.90 with the items 4,10,11 (Adherence to appropriate diabetes treatment is very important for the healing rate of diabetic foot ulcers), (Advise the patient to wear wool socks in the winter and silk

socks in the summer), and (Should be wash your feet daily and avoid soaking them for a long time in water), as general the grand mean of score of the present study was good, The findings of the current study disagree with the findings of the study of Gabish and Mohammed, <sup>(16)</sup>, in Baghdad, Iraq, which indicated that total of mean of score was fair.

### Association between Overall Nurses' Knowledge toward Nursing Care of Diabetic Foot Ulcers and their Demographic Data

The present study (table 4-4) shows that there is a high significant relationship between overall nurses' knowledge toward nursing care of diabetic foot ulcers and their demographic data at  $p \leq 0.05$  such as (age, gender, educational level, years of experience and training course), while with (number of training courses) that there is a non-significant relationship with nurses' knowledge toward nursing care of diabetic foot ulcers at  $p \leq 0.05$ . The findings of the current study agree with the results of the study done by Mersal at Ain Shams University in Egypt, which refers that there is a non-significance association among the patient for number of training courses and marital status ( Mersal et al., 2013). While Jackson et al., disagreed with what we found in this study because they found that there were non-significant. Jackson et al. said that "nurses' diabetes self-care knowledge was generally non-significant among the target sample studied. Educational status, monthly income, duration of diabetes and negative attitude to disease condition predicted knowledge level".

## Conclusion:

Relative to the interpretation and discussion of the findings, the study can conclude that:

a. Overall assessment level of overall assessment level nurses' knowledge toward diabetic foot ulcers in present study as a general is good level.

b. The sample has highest percentage from young age, male, diploma level, and share in training course of diabetic foot ulcers.



c. There is a high significant relationship between nurses' knowledge toward nursing care of diabetic foot ulcers and some their demographic data at  $p \leq 0.05$  such as age, gender, educational level, years of experience and training course.

### **Recommendations:**

Based on present study results, it is recommended that:

- Provision of qualified registered nurses to provide quality nursing care for patients which diabetic foot ulcers at diabetic center in Merjan medical city.

- Establishment plans of training and development for nursing staff to increase their knowledge, awareness, and skills about the nursing care which provided the patients with diabetic foot ulcers.

- The study findings may be regard as basic data for further research for nurses' knowledge toward nursing care of diabetic foot ulcers in Iraq.

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Nil.

### **Conflicts of interest**

There are no conflicts of interest.

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