

## Original Research Article

### KNOWLEDGE, ATTITUDE AND PRACTICES (KAP) ON DIABETIC FOOT CARE AMONG PATIENTS WITH DIABETES IN DISTRICT BAHAWALPUR, PAKISTAN

#### Abstract

Diabetes mellitus is a chronic multifactorial metabolic illness that is characterized by numerous chronic complications. Diabetes affects almost every system of the body. Among these diabetic foot is one of the major complications of diabetes mellitus. Its main objective was to investigate the knowledge, attitude and foot care practices in diabetic patients suffering from diabetic foot lesions. An institutional-based cross-sectional study was designed to be conducted at Civil Hospital, Bahawalpur, Pakistan. Total 150 diabetic patients were selected by systematic random sampling method. Ratio of Type II diabetes was 91.3% whereas 23.3% patients were having family history of diabetes. 44.35% patients were having some knowledge about diabetes related complications whereas 45.44% patients were having a positive attitude towards control and prevention of diabetes related complications. Good foot care and footwear practices were being carried out by just 33.62% of the patients. Education regarding reducing increased body weight, knowledge about foot care practices, early detection and management of peripheral neuropathy and strict glycemic control could be very helpful in decreasing the diabetic foot complication.

**Key words:** Diabetes Mellitus, Knowledge, Attitude, Practice

#### 1. Introduction

Diabetes mellitus is a chronic and complex metabolic disorder requiring continuous and proper medical care for maintenance of normal blood glucose level and reduction of complications (1). (2). Significant research evidences suggest that a wide range of interventions are required for the improvement of diabetic outcomes (3). Although a long list of complications affects a diabetic patient but one disastrous complication is diabetic foot or foot ulcer/lesion (4). Diabetic foot lesion has notable impact on socio-economic status and well being and of diabetic patient. It not

**Comment [Mw1]:** In the abstract section of the article, the method of work is explained very briefly. How to select samples and sampling and data collection method is not well explained

**Comment [Mw2]:** Match keywords with mesh in Pabmad

**Comment [Mw3]:** Introduction Your study is very briefly written Many required content has been removed Mention new statistics and figures in this field by mentioning valid and up-to-date references

only hampers the quality of life but also has conspicuous result on the financial status of a diabetic patient (5).

Diabetic Foot lesion is a devastating condition because it also increases the rate disability and even death of diabetic patients (6). Foot ulcers can lead to recurrent hospital admission, superadded bacterial infections of lesions and even limb amputation in severe cases (7). Diabetic foot is very common and also one of most expensive complication of diabetes (8). In developing countries like Pakistan, diabetic foot lesions are very distressing for the diabetics (9). It is not only associated with significant risk of disability, morbidity and mortality but has a great psychological impact on diabetic patients (10). Study evidences suggest that 15% of diabetic patients can suffer from diabetic foot lesions at some stage of their disease (11). Severity of complication can vary from simple boil to life threatening secondary bacterial infection or even limb amputation (12).

Risk factors for diabetic foot lesions include peripheral neuropathy, peripheral vascular disease, shoes pressure, poor blood glucose control, cigarette smoking etc and these factors can also play an important role in patho-physiology of the disease (5). Although diabetic foot is a devastating and protracted condition associated with diabetes even then it can be prevented in high risk patients (6, 13). Prophylactic practices are very economical but not much prevalent that's one of the reason that incidence of diabetic foot lesion is very common and a challenge as well for health care professionals (14). Diabetic foot lesions need reliable, systematic and exclusive health care facilities for the prevention, early detection and management in diabetics (15). Study analysis recommend that age and weight along with educational status, self care practices, type of diabetes has remarkable effect on diabetic foot lesions (16). Yet, determining factors vary widely among diabetic patients with different socioeconomic status and has different influential factors for development of complications (17). Therefore, identification of such striking factors is very important for prevention of calamitous effect of diabetic foot lesions (18). Current study was designed to evaluate diabetic foot lesions and corresponding risk factors in adult diabetic patients visiting the diabetic clinic at the Civil Hospital, Bahawalpur, Pakistan. The findings of current study can be helpful in reducing the incidence of diabetic foot lesions and its associated complications in this region.

## 2. Methodology

**Comment [Mw4]:** Multiple evidence .... need multiple references ?!

**Comment [Mw5]:** The importance of the topic and the study is not written in this article. In Pakistan, what are the statistics of this population regarding diabetes and diabetic foot?

**Comment [Mw6]:** Did you not explain at all about this cap model that you used? Why this model? Where is its application in this study?

An institutional-based cross-sectional study was conducted at Civil Hospital, Bahawalpur from the 1<sup>st</sup> of February to the 30<sup>th</sup> of March, 2019. Civil Hospital, Bahawalpur is a teaching and general hospital. It also serves as referral center for many patients from peripheral areas. Study population comprised of all diabetic patients who were attending the diabetic follow-up at the Civil Hospital, Bahawalpur during above mentioned time period. Diabetic patients having any lesion due to any trauma, accident and seriously ill patients or unable to communicate were excluded from the study. Diabetic foot lesion was dependent variable in this study. Whereas age, sex, religion, ethnicity, educational status, marital status, address, socioeconomic status, physical activity, cigarette smoking, type and duration of diabetic illness, body mass index, regular follow-up visit, history of ulceration, neuropathy and peripheral vascular disease were independent variables.

### 2.1: Sampling Procedure

Systematic random sampling method was adopted for selection of diabetic patients suffering from diabetic foot lesions. Patient was labeled as diabetic if his/her fasting blood glucose level was above 125 mg/dl. If patient's fasting blood glucose level was in the range of 100 and 125 mg/dl, he/she was labeled as controlled. Diabetic foot lesion is a non traumatic laceration of skin on the foot of a person suffering from diabetes. Patients scoring mean (6) and above from knowledge assessment questionnaire were considered knowledgeable. Patients scoring mean (7) and above from foot care practice assessment questionnaire were considered as good in foot care practices. Patient was suffering from neuropathy if he/she had at least one of the following symptoms: gradual numbness, burning pain, freezing, vibration from the skin, muscle weakness, extreme sensitive to touch and lack of coordination. Diabetic patient having one of the following symptoms was suffering from peripheral vascular disease: muscle cramps after movement, painful cramping in their hip, erectile dysfunction, sores on the toes, numbness of legs, change in the color of legs, shiny skin of leg and lesion on legs or feet that is not healing.

### 2.2: Data Collection and Analysis

Data was collected by a structured and pretested questionnaire via face-to-face interview and by direct observation of the patient. The questionnaire was prepared in English, translated to local

**Comment [Mw7]:** What is the data collection tool in this study? Standard or researcher made?

**Comment [Mw8]:** How many questions was the questionnaire? When did you collect this information?

**Comment [Mw9]:** Explain the validity and validity of the instrument and validation

**Comment [Mw10]:** In this section, you should write the type of statistical analysis you used, you did not mention it at all.

language (Urdu) then back to English to keep its consistency. Data collectors were also given one day training. All adult diabetic patients attending the diabetic follow-up at the Civil Hospital, Bahawalpur, were included in this study. Diabetic foot lesions were measured in non traumatic diabetic patients.

### 2.3: Ethical Considerations

**Comment [Mw11]:** Write the code of ethics with the design number.

Ethical clearance was obtained from the Institutional Ethical Committee of the University College of Conventional Medicine, The Islamia university of Bahawalpur. An official letter of cooperation was written to the Civil Hospital Bahawalpur administration. After explaining the purpose of the study, an informed written consent was obtained from each of the study participant according to the declaration of Helsinki. Participants were also informed that participation was on a voluntary basis and that they could withdraw at any time, for any reason. Personal identifiers were not included in the written questionnaires to ensure participants' confidentiality.

## 3. Results

### 3.1: Socio-demographic Characteristics

Total 150 diabetic patients were included in the study. Sex distribution was 56% (84 male patients) and 44% (66 female patients). Age of the patients was from 21-50 years. 13 (8.66%) patients were suffering from Type I diabetes whereas 137(91.3%) patients were suffering from type II diabetes. No case of gestational diabetes was reported. 35 (23.3%) patients had a family history of diabetes (Table 1).

**Table 1: Socio-demographic Characteristics**

**Comment [Mw12]:** Fill in the separate title ..... What is the example and where

	Frequency	Percentage
<b>Age distribution</b>		
21-30	27	18%
31-40	52	34%
41-50	71	47.3%

**Comment [Mw13]:** In Table 1, why did not you check the mean for the variables and write with the standard deviation?

<b>Sex distribution</b>		
Male	84	56%
Female	66	44%
<b>Diabetes mellitus type</b>		
Type I	13	8.66%
Type II	137	91.3%
GDM	-	-
<b>Family history of diabetes</b>	35	23.3%
<b>Diabetes education</b>	69	46%

### 3.2: Knowledge about Diabetic Foot

Total 150 patients participated in this study from which 45.37% people were aware and 42.75% were unaware of foot care practices. 24.7% patients were not having any knowledge about it. Feet were examined by 86(57.3%) patients on regular basis whereas 21(14%) patients didn't examine their feet. n=43(28%) participants were not aware of this point. 94(62%) patients were having some knowledge regarding foot complications, 35(23%) participants were not aware and 21(14%) participants answered that they DON'T KNOW. 69(46%) patients were having knowledge about reduced blood flow in their feet while 32(21.3%) patients didn't know it. 43(28.6%) patients were aware that reduced blood flow to feet could develop foot ulcers while 54(36%) patients had no knowledge of it. 66(44%) patients observed loss of sensation in their feet whereas 21(14%) didn't. 89(59.3%) patients were aware of developing foot gangrene while 43(29.6%) were not. 98(65.3%) patients were getting proper information regarding foot care whereas 33(22%) patients were not getting any such awareness. 35(23.3%) patients were having knowledge that smoking can reduce blood flow towards feet whereas 78(52%) patients were not aware of it (Table 2).

**Table 2: Knowledge about Diabetic Foot**

	Yes		NO		Don't know	
	Number	%	Number	%	Number	%
<b>Examination of</b>	86	57.3	21	14	43	28

feet						
Knowledge of foot wound/infection	94	62	35	23	21	14
Reduced blood flow to feet	69	46	32	21.3	49	32.6
Foot ulcers due to reduced blood flow	43	28.6	54	36	53	35.3
Loss of sensation in feet	66	44	21	14	63	42
Foot gangrene	89	59.3	43	28.6	18	12
Foot ulcers	56	37.3	71	47.3	23	15.3
Information regarding foot care	98	65.3	33	22	19	12.6
Effect of smoking	35	23.3	78	52	37	24.6

**Comment [Mw14]:** In Table 2, it is better to write the questions as complete phrases or a complete question ?!

### 3.3: Patient's Attitude towards control & prevention of Diabetic Foot

Next questionnaire was to assess the attitude of participants towards control and prevention of diabetic complications. 45.44% participants attitude was good towards foot care and 24.24% participants was not satisfied and the attitude of 30.24% was with a label of don't know as they were totally unaware of diabetic foot care. Questions regarding life style changes, any effect of routine changes on the control of diabetes and its complications was asked. Neither the patients were willing to wear any special foot ware to reduce the foot ulcers nor were they doing any self examination of the feet (Table 3).

**Comment [Mw15]:** In Tables 2 and 3, you can take the average for knowledge, attitude, etc., and then compare with each other. Why only numbers and percentages are taken?

**Table 3: Patient's Attitude towards control & prevention of Diabetic Foot**

	Yes		NO		Don't know	
	Number	%	Number	%	Number	%
Life style changes	108	72	26	17.3	16	10.6
Effect of routine	81	54	47	31.3	22	14.6

changes						
Willing to use special footwear	55	36.6	41	27.3	54	36
Use of indoors footwear	24	16	39	26	87	58
Self examination of feet	73	48.6	29	19.3	48	32

### 3.4: Foot care and footwear Practices by diabetic Patient

The net result of participants that were carrying good foot care practices was about 33.62%, about 46.44 participants were not practicing any technique and almost 19.5% participants were not having any knowledge about it. Daily foot washing was done by 108 (72%) patients and 26(17.3%) were not washing their feet daily. Foot temperature was checked by 86 (57.3%) patients and 59(39.3%) patients were not doing so. Nail care was done by 46 (30.6%) patients whereas 89(59.3%) were not paying attention to it. Toes care was done by 68(45.3%) patients whereas it was neglected by 44(29.3%) patients. 69 (46%) patients were keen to observe their feet after removal of socks and shoes whereas 48 (32%) were not doing any such practice (Table 4).

**Comment [Mw16]:** In Tables 2 and 3, you can also write the total score of the variables.

**Table 4: Foot care and footwear Practices by diabetic Patient**

	Yes		NO		Don't know	
	Number	%	Number	%	Number	%
Daily foot wash	108	72	26	17.3	16	10.6
Feet temperature	86	57.3	59	39.3	48	32
Follow up visit	23	15.3	108	72	19	12.6
Shoe examination	22	14.6	79	52.6	49	32.6
Feet comfort in shoes	28	18.6	64	42.6	58	38.6
Nail care of feet	46	30.6	89	59.3	15	10
Toes care	68	45.3	44	29.3	38	25.3
Moisturization of	31	20.6	78	52	41	27.3

**Comment [Mw17]:** It is better to explain the number of questions for each variable and the way of scoring and where the root of the tool comes from in the working method section.

**Comment [Mw18]:** First, you can merge all 3 variable tables. Also, modify the expressions in all 3 tables according to the comments in Table 2.

<b>feet</b>						
<b>Feet examination after socks/shoes removal</b>	69	46	48	32	33	22
<b>Notice of injury</b>	20	13.3	96	64	34	22.6

#### 4. Discussion

Current study indicates that poor educational status, low socioeconomic conditions and negligence about foot care were the contributory factors for increasing incidence of diabetic foot lesions. Uncontrolled diabetes mellitus also increases the severity of disease and makes patients more prone towards complications including diabetic foot (19). Data shows that bad selection of shoes like chappals by diabetics having no support for heel and divider that is splitting the toes is one of major risk factor (20). Detailed feet examination should be carried out at each follow up visit by the physician to prevent neuropathy at its initial stage (20-22). Neuropathy leads to loss of sensation in feet (23). This is why abnormal and persistent increased pressure on feet remains undiagnosed. Skin cell react to this increased pressure by increasing keratinization that facilitates callus formation (24). Callus itself predisposes diabetic patient to foot lesions (25). Decreased blood supply to feet also slows down the healing process in case of any lesion or injury in this area (26). That's the reason foot callus develop very quickly in patients suffering from peripheral neuropathy (27). Increased body weight of diabetic patients is also another risk factor (28). Obesity increases the risk of atherosclerosis in diabetic patients that cause decrease blood supply to lower extremities particularly feet. In case of any wound the conditions are also favorable for the growth of bacteria as well that lead to secondary bacterial infection of the diabetic feet (29).

Foot care practices vary from person to person among diabetics (30). The results showed that a good foot care practice is very protective in reducing the likelihood of diabetic foot lesions. This finding is also comparable with the previous studies conducted in different settings (31). Poor foot care practices like lack of daily feet washing, proper drying of feet after washing or after removal of shoes and socks and lack of early detection and management of any abnormality contribute to the increased incidence of diabetic foot lesions (31). Prolonged diabetic illness and poverty were two major risk factors for the development of foot lesions (32).

**Comment [Mw19]:** It is better to write the discussion in the order of the results obtained

**Comment [Mw20]:** In the discussion section, you should write the discussion according to the results obtained for each of the 3 separate variables  
First, write the results of your study for knowledge, then compare several references with other studies, and then give the reason for your justification.  
And ...

In order to decrease the risk of foot lesions it is recommended that patient should inspect his/her feet on daily basis for any cut, blister, redness, swelling or any nail problem (33). Daily feet washing with luke warm water and drying properly especially between toes should be advised. A good moisturizer should be used to avoid cracking and itching (34). Nails should not be cut too short in order to avoid ingrowing (35). Patient should not treat any corn or callus by him/herself (36). Proper medical advice is needed in such cases. Blood glucose level should be controlled in normal range (37). Patient should not walk bare footed in order to avoid any cut or scratch (38). Smoking should be avoided as it restricts blood flow towards feet (39). Feet should be kept dry and warm (40). Regular examination of the feet is very much important (31).

## 5. Conclusion

Ratio of Diabetic foot lesion was very alarming in patients suffering from diabetes mellitus. It is important to develop awareness of diabetes and its complications in the general population. Health care professionals can play their role in tackling diabetic foot lesions by educating patients about foot care practice, life style changes and proper follow-up especially of the patients who are from rural areas. By educating diabetic patient about control of diabetes and body weight, early detection and management of any foot lesion, infection or neuropathy can be helpful in reducing the incidence of diabetic foot lesions.

### Study limitations

The small sample size was the limitation of this study. It was a cross-sectional study design that decreased the power of the study. It also decreased causal conclusion between diabetic foot lesions and its associated risk factors.

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**Comment [Mw21]:** Write down the strengths and weaknesses of your study and your suggestions for other studies

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