



CODEN [USA]: IAJPB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.3712671>Available online at: <http://www.iajps.com>

Research Article

**IMPACT OF SOCIODEMOGRAPHIC FACTORS ON
KNOWLEDGE AND PRACTICE OF DIABETIC FOOT CARE:
A STUDY CONDUCTED AT A TERTIARY CARE HOSPITAL,
MULTAN, PAKISTAN**Ahmad Usman¹, Ahmad Riaz², Ahmad Shehzad³¹Department of Orthopedic Surgery, Nishtar Medical University and Hospital, Multan.²Department of General Surgery, Nishtar Medical University and Hospital, Multan.³Department of General Medicine, Nishtar Medical University and Hospital, Multan.**Article Received:** January 2020 **Accepted:** February 2020 **Published:** March 2020**Abstract:**

Objective: To evaluate the impact of sociodemographic factors on proper knowledge and practice of diabetic foot care among diabetic patients.

Methods: This cross-sectional study was conducted on a convenient nonprobability sample of 160 diabetic patients visiting the diabetic clinic in the outpatient department of Nishtar Medical University and Hospital Multan from January to April 2019. Their knowledge and practice were assessed by asking eleven questions for each, giving one score for every correct response. Depending upon their scores, their knowledge and practice were considered good, satisfactory, and poor if answers to questions were correct more than 80%, 50 to 69%, and less than 50%, respectively. These scores were compared with the sociodemographic factors of patients.

Results: The mean age of the respondents was 53.51±8.1. The knowledge of 25.6%, 46.9%, and 27.5% of the respondents was good, satisfactory and poor, respectively. Regarding practice, 19.4%, 52.5% and 28.1% of respondents were in the good, satisfactory and poor category, respectively. Education level and income had a significant association with both knowledge and practice. The duration of diabetes had a significant impact on the knowledge of the patients, while the rural background significantly affected their practice.

Conclusion: The state of knowledge and practice of the patients of this region is highly inadequate. Steps should be taken to improve the education and socioeconomic standing of the patients, which will, in turn, improve their practices decreasing the incidence of foot ulcers and resulting amputations.

Keywords: Diabetic foot, Foot care, Diabetic ulcer, Diabetes, Sociodemographic factors.

Corresponding author:

Ahmad Usman,

Department of Orthopedic Surgery,

Nishtar Medical University and Hospital, Multan.

QR code



Please cite this article in press Ahmad Usman et al., *Impact Of Sociodemographic Factors On Knowledge And Practice Of Diabetic Foot Care: A Study Conducted At A Tertiary Care Hospital, Multan, Pakistan*, Indo Am. J. P. Sci, 2020; 07(03).

INTRODUCTION:

Diabetes Mellitus (DM) is one of the major contemporary public health issues and is considered to be the epidemic of the 21st century. It is characterized by high blood glucose levels caused by decreased insulin secretion, decreased glucose utilization, or increased glucose production [1].

A staggering 463 million people are living with diabetes. Estimates given by the International Diabetes Federation predict that there will be 578 million adults with diabetes by 2030, and 700 million by 2045. The disease is rampant in both developing and developed countries, including Pakistan. According to the report of the International Diabetes Federation, in 2019, 19.63 million people had diabetes in Pakistan in the age group of 20-79 years. This number is expected to reach 37.12 million by the year 2045. Additionally, another 8.7 million people have impaired glucose tolerance and are at high risk of developing diabetes soon [2].

Patients suffering from DM are prone to developing a multitude of acute and chronic complications. One of the most prevalent and grave of these complications is diabetic foot disease. Diabetic foot can lead to ulceration, infection, and destruction of deep tissues leading to severe morbidity and mortality. Diabetic patients have a 15-25% lifetime risk of developing foot ulcers [3]. Once an ulcer has developed, there is a high risk of it leading to amputation. One out of six patients will have an amputation ultimately [4]. In diabetic patients, 84% of non-traumatic limb amputations are preceded by foot ulcers [5]. Limb amputations are the most expensive and feared consequence of foot ulcers inflicting economic burden and affecting the quality of life.

Although DM is incurable, its complications are preventable. Diabetic patients who are at risk need a complete clinical examination of their feet, regular follow-ups, and education for the prevention of the development of ulcers. Poor glycemic control, wearing hard uncomfortable shoes, walking barefooted, improper cutting of nails, and being oblivious to foot care guidelines make the feet more prone to trauma and thus increasing the incidence of foot ulcers. The International Working Group on Diabetic Foot has issued guidelines for the prevention of such ulcers [6].

The current study was carried out with the objective of assessing how the sociodemographic factors affected the foot care of patients belonging to relatively less developed areas of Pakistan, i.e., South Punjab. Besides the fact that no significant study has been conducted in this region of Pakistan,

another reason to conduct the study was the observation of authors that proper foot care habits were pretty unknown and unpracticed by the patients of this region. With this grave situation in our mind, we conducted this study with the hope that conclusions drawn from this study might help in the improvement of health care delivery to diabetic patients.

MATERIALS AND METHODS:

This institution-based descriptive cross-sectional study was conducted at the Diabetic Clinic in the outpatient department of Nishtar Medical University and Hospital Multan, from January to April 2019. Nishtar Medical University and Hospital Multan is the only major tertiary care hospital serving the needs of the whole Southern Punjab. On average, 3500 patients visit the Diabetic Clinic of this hospital monthly.

The inclusion criteria entailed diagnosed cases of type 2 DM for at least 12 months and ≥ 18 years old. While the patients with type 1 DM, with active or treated foot ulcers, were excluded.

The minimum sample size was calculated using the Cochran formula:

$$n = Z^2pq/d^2$$

n =sample size. z =standard normal deviation, set at 1.96 equivalent to 95% confidence interval. p =prevalence of DM in Pakistan=9.8% [2]. q =(1- p). d =absolute precision set as 5%. The calculated minimum sample size was 136, but a total of 160 subjects were included using convenient nonprobability sampling. The survey instrument used was a structured questionnaire adapted from the recommendations of the American College of Foot and Ankle Surgeons and pre-tested in the previous studies [7,8,9].

Approval was obtained from the institutional ethics committee. The questionnaire was translated into the local language Urdu. After explaining the purpose of the study and taking verbal consent from the respondents, questions were asked orally by the primary researchers themselves to increase reliability. Sufficient time to answer the questions was given to each respondent. In the first section of the questionnaire, sociodemographic information was acquired, including their age, marital status, residence, educational status, and income. Duration and family history of diabetes mellitus were also noted. Eleven questions were asked for each to assess the knowledge and practice of patients. The data were analyzed by SPSS version 25. The results were presented using frequency tables and

percentages, and chi-square test was applied to find out any statistical significance of demographic factors on knowledge and practice of foot care. The level of statistical significance was defined as a two-sided p-value of <0.05. Each correct response was assigned one mark, and the total knowledge and practice score for each respondent was classified as good, satisfactory and poor. Score $\geq 80\%$ (9-11) was regarded as good, score 50-69% (6-8) was

considered satisfactory, and score <50% (<6) was taken as poor.

RESULTS:

Of the total of 160 respondents, 91 (56.9%) were males, and 69 (43.1%) were females. The mean age of the respondents was 53.51 ± 8.1 . The sociodemographic characteristics of the population are given in Table 1.

Table 1: Characteristics of the study participants(n=160)

Variable	Categories	Frequencies (%)
Age	<60	125 (78.1%)
	>60	35 (21.9%)
Gender	Female	69 (43.1%)
	Male	91 (56.9%)
Marital Status	Married	148 (92.5%)
	Unmarried	12 (7.5%)
Residence	Rural	21 (13.1%)
	Urban	139 (86.9%)
Educational Status	Illiterate	55 (34.4%)
	Can Read Write	34 (21.3%)
	Matriculation	39 (24.4%)
	Graduate	22 (13.8%)
	Highly qualified	10 (6.3%)
Occupation	Manual work	64 (40.0%)
	Office work	29 (18.1%)
	Household/ Retired	67 (41.9%)
Income	<20,000	106 (66.3%)
	20,000-50,000	42 (26.3%)
	50,000-80,000	12 (7.5%)
Duration of diabetes	<10 years	66 (41.3%)
	>10 years	94 (58.8%)
Family history of diabetes	Yes	96 (60.0%)
	No	64 (40.0%)

Knowledge:

The mean knowledge score was 6.89 ± 2.52 . On classifying the knowledge score of the study subjects, 41 (25.6%) fell in the category of good knowledge, 75 (46.9%) in the satisfactory category, and 44 (27.5%) in the poor category. The distribution of the responses of subjects to knowledge related questions is given in the Table 2.

Table 2: Distribution of the responses to questions of knowledge

Questions related to Knowledge	Correct (%)	Wrong(%)
1. DM patients should take medication regularly because they are liable to get DM complications.	154 (96.3%)	6 (3.8%)
2. How often do you think you should inspect your feet?	94 (58.8%)	66 (41.3%)
3. If you found redness/bleeding between your toes what is the first thing you do?	113 (70.6%)	47 (29.4%)
4. DM patients should look after their feet because they may not feel a minor injury to their feet.	130 (81.3%)	30 (18.8%)
5. DM patients should look after their feet because wounds and infection may not heal quickly.	128 (80.0%)	32 (20.0%)
6. DM patients should look after their feet because they may get a foot ulcer.	138 (86.3%)	22 (13.8%)
7. DM patients should not smoke because smoking can be harmful for their feet.	102 (63.7%)	58 (36.3%)
8. What temperature of water do you think you should wash your feet in?	57 (35.6%)	103 (64.4%)
9. Do you think you should dry between your toes after washing your feet?	80 (50.0%)	80 (50.0%)
10. How often do you think you should wear shoes and socks?	46 (28.7%)	114 (71.3%)
11. Do you think you should inspect the inside of your footwear for objects or torn lining?	60 (37.5%)	100 (62.5%)

Practice:

The mean practice score was 6.74 ± 2.08 . On classifying the practice scores of the study, 31 (19.4%) respondents followed good foot care practices, 84 (52.5%) had satisfactory practice, and 45 (28.1%) had poor practice. The distribution of the responses of patients to practice related questions is given in the Table 3.

Table 3: Distribution of the responses to questions of practice

Questions related to Practice	Yes (%)	No (%)
1. Do you take your medications regularly?	148 (92.5%)	12 (7.5%)
2. Do you inspect your feet regularly?	105 (65.6%)	55 (34.4%)
3. Do you wash your feet regularly?	151 (94.4%)	9 (5.6%)
4. Do you wash feet with warm water?	83 (51.9%)	77 (48.1%)
5. Do you dry between your toes after washing?	56 (35.0%)	104 (65.0%)
6. Do you trim toe nails straight across and not too short?	74 (46.3%)	86 (53.8%)
7. Do you clean nails with sharp instrument?	31 (19.4%)	129 (80.6%)
8. Did you measure your feet size when last you bought footwear?	105 (65.6%)	55 (34.4%)
9. Do you inspect the inside of your footwear?	47 (29.4%)	113 (70.6%)
10. Do you regularly wear socks indoors?	42 (26.3%)	118 (73.8%)
11. Are you a smoker?	21 (13.1%)	139 (86.9%)

Impact of Demographic Factors on Knowledge and Practice:

The study revealed that educational status and income had a significant association with both knowledge ($p=0.0001$ and $p=0.0001$ respectively) and practice ($p=0.0001$ and $p=0.0001$ respectively) regarding diabetic foot care, hence rejecting the null hypothesis. Practice ($p=0.0001$) showed a significant association with the residence of the

patients in rural and urban areas. The duration of diabetes showed a significant impact on the knowledge ($p=0.015$) but not on practice ($p=0.440$). Age and gender of the patients did not influence knowledge ($p=0.897$ and $p=0.223$ respectively) and practice ($p=0.234$ and $p=0.391$ respectively). Family history and occupation also did not show any significance as shown in Table 4.

Table 4: Association of sociodemographic factors with knowledge and practice

Variables		Knowledge scores			Chi-square value	P-Value
		Good	Satisfactory	Poor		
Education	Illiterate	3 (5.5%)	31 (56.4%)	21 (38.2%)	39.142	0.001
	Can read write	6 (17.6%)	14 (41.2%)	14 (41.2%)		
	Matriculation	13 (33.3%)	19 (48.7%)	7 (17.9%)		
	Graduate	12 (54.5%)	8 (36.4%)	2 (9.1%)		
	Highly qualified	7 (70.0%)	3 (30.0%)	0 (0.0%)		
Income	<20,000	16 (15.1%)	52 (49.1%)	38 (35.8%)	22.225	0.001
	20,000-50,000	20 (47.6%)	17 (40.5%)	5 (11.9%)		
	50,000-80,000	5 (41.7%)	6 (50.0%)	1 (8.3%)		
Residence	Rural	2 (9.5%)	10 (47.6%)	9 (42.9%)	4.521	0.104
	Urban	39 (28.1%)	65 (46.8%)	35 (25.2%)		
Duration Of Diabetes	<10 years	15 (22.7%)	25 (37.9%)	26 (39.4%)	8.087	0.018
	>10 years	26 (27.7%)	50 (53.2%)	18 (19.1%)		
		Practice score			Chi-square value	P-Value
		Good	Satisfactory	Poor		
Education	Illiterate	1 (1.8%)	30 (54.5%)	24 (43.6%)	36.587	0.001
	Can Read Write	4 (11.8%)	18 (52.9%)	12 (35.3%)		
	Matriculation	11 (28.2%)	21 (53.8%)	7 (17.9%)		
	Graduate	10 (45.5%)	10 (45.5%)	2 (9.1%)		
	Highly qualified	5 (50.0%)	5 (50.0%)	0 (0.0%)		
Income	<20,000	10 (9.4%)	59 (55.7%)	37 (34.9%)	23.028	0.001
	20,000-50,000	15 (35.7%)	20 (47.6%)	7 (16.7%)		
	50,000-80,000	6 (50.0%)	5 (41.7%)	1 (8.3%)		
Residence	Rural	2 (9.5%)	5 (23.8%)	14 (66.7%)	17.768	0.001
	Urban	29 (20.9%)	79 (56.8%)	31 (22.3%)		
Duration Of Diabetes	<10 years	11 (16.7%)	33 (50.0%)	22 (33.3%)	1.643	0.440
	>10 years	20 (21.3%)	51 (54.3%)	23 (24.5%)		

DISCUSSION:

This study investigated the level of proper podiatric care knowledge and practice among the diabetics and the demographic factors which significantly affected them. The results revealed an alarming situation of healthcare among patients in the region of South Punjab, with the majority of the patients having poor knowledge and poor practices. Less than one-third (25.6%) of the respondents had good knowledge. An even worse condition was seen regarding practice, with only 19.4% following good practices. Similar results were seen in studies conducted in other areas of Pakistan [10,11,12]. A study conducted by Nadia Saeed revealed only 6% of respondents to be following good practices [11]. Seema and Naheed conducted their study in Lahore, Pakistan revealing that 29.3% of patients had good knowledge, and 14% followed good practices [10]. Poor scores were noted in studies done in other countries as well [13,14,15].

Among the sociodemographic factors, the educational status, monthly household income, and the place of residence were found to be significantly impacting these results. Notably, the educational level of patients showed a massive impact on the results. Out of the 160 respondents, 89 (55%) had a poor educational status, i.e., they were either illiterate or could just read and write while 71 (45%) of the total 160 respondents had a good educational status, i.e., matric or above matric. Good knowledge was seen just in 9 poorly educated as compared to 32 well-educated respondents. Similarly, good practice was seen in only five poorly educated as compared to 26 well-educated patients. A similar massive impact of education is shown by studies done in other regions of Pakistan and other countries as well [10]. Researches conducted in Nigeria and Iran also showed that poor knowledge is significantly related to poor educational status [9,16]. Similarly, Viswanathan, in his study, conducted in India, reported that illiterate people had the least knowledge and the worst practices [17]. This association may be attributed to the fact that formally educated patients can better understand the dynamics of their disease, can better adhere to their physician's counseling and can have more access to information available on the internet and other sources.

Low household income was also found responsible for poor foot care practices. In the low-income group (less than 20,000 Pakistani rupees per month), only 10% of respondents practiced good foot care routine. While in the high-income group (more than 20,000 Pakistani rupees per month), 39% of respondents followed the principles of good foot care. Economic status affects this for multiple reasons. Patients belonging to low social class cannot keep scheduled appointments owing to transportation and

consultation costs and the inability to take time off their work. In our setup, the majority of patients, being manual workers, with meager incomes, could not afford the cost of medicine, glucose monitoring devices, proper diabetic diet and proper footwear. All these factors limit the ability of these people to improve their practices. A similar study was done in Ethiopia, where 23 percent of the respondents reported that their profession was the main barrier in the way of proper foot care practices [18]. This is also in accordance with another research done in Nigeria [9].

Another compelling inference derived from this study is that some practices are prevalent among patients regardless of their knowledge status. For instance, 94.4% of the respondents washed their feet regularly, and the high percentage of this healthy practice can be attributed to the fact that the majority of the population in Pakistan is Muslim. Muslims wash their feet as a part of ablutions before every prayer. This also gives them a chance to inspect their feet. Hence, a higher percentage of the respondents inspected and washed their feet regularly as compared to other practices where the frequency was found unsatisfactory. This showed that they were not washing their feet because of their knowledge that it may prevent foot ulcers, rather they did that as a religious obligation. This result was also reported by researchers doing similar studies in Lahore and Karachi, where 89% and 87.5% of respondents said that they washed their feet regularly [10,12].

In addition to social factors, some environmental factors also affect the practices of patients in this region. For example, only 26.3% of the people wore socks regularly, and most of them reported the hot temperature in South Punjab to be the cause of non-adherence to this healthy practice. Moreover, due to the same reason, the majority of the patients preferred wearing open footwear making their feet more prone to trauma. In many studies, direct trauma to feet has been reported to be one of the causes of foot ulcers. Wearing appropriate footwear reduces the rates of foot ulcers and other complications significantly [19]. Thus the hot climate of this region limits this good practice in patients as well.

Better knowledge and better practice of people coming from urban areas reflect the need for the provision of better health awareness and health education in rural areas. This study also revealed better knowledge among respondents who have had diabetes for a longer duration of time. Place of residence and duration of diabetes was found significantly associated with practices in Ethiopia as well [18]. This difference can be explained by the fact that such patients happen to come in contact

with healthcare professionals more often than relatively newer patients, gaining more understanding of their disease. Increased gap and poor communication have been reported as a barrier to proper foot care in different researches [15,20]. The conclusion we can draw from this is that if the gap between patients and healthcare professionals is reduced, the knowledge and practice of the patients can be made a lot better. Thus, some extra time must be spared for every patient during each clinical visit for his education, counseling and thorough examination of his feet according to guidelines to assess the risk of foot ulcers.

CONCLUSION:

The overall poor knowledge and practice of patients, affected significantly by their socioeconomic standing and educational background, highlights the grim situation of health facilities available in the South Punjab of Pakistan. The results emphasize the importance of patient-centered education and acknowledgment of patients' differences in social stability and demographic profiles.

It is the need of the hour for the stakeholders to launch a comprehensive foot care program in hospitals all over the country. The program should encompass patient education, counseling, footwear recommendations, screening, examination, diagnostic tests, referrals, and regular follow-ups. In addition to improving health policies, steps need to be taken to increase the literacy rate and socioeconomic standing of the population. Only then will the patients be able to understand and manage their disease effectively.

REFERENCES:

1. Tarekegne FE, Padyab M, Schröders J, Stewart Williams J. Sociodemographic and behavioral characteristics associated with self-reported diagnosed diabetes mellitus in adults aged 50+ years in Ghana and South Africa: results from the WHO-SAGE wave 1. *BMJ Open Diab Res Care*, 2018, 6:000449.
2. International Diabetes Federation. *IDF Diabetes Atlas*, 9th edn. Brussels, Belgium: 2019. Available at: <https://www.diabetesatlas.org>
3. Chiwanga FS, Njelekela MA. Diabetic foot: prevalence, knowledge, and foot self-care practices among diabetic patients in Dar es Salaam, Tanzania - a cross-sectional study. *J Foot Ankle Res*, 2015, 8:20-20.
4. Tchanque-Fossuo CN, Wishy AM, West KIM, Dawson DL, Dahle SE, Carson JG. Reclaiming Autologous Amputated Tissue for Limb Salvage of a Diabetic Foot Burn with Underlying Critical Limb Ischemia. *Adv Skin Wound Care*, 2018, 31:596-600.
5. Brem H, Sheehan P, Rosenberg HJ, Schneider JS, Boulton AJ. Evidence-based protocol for diabetic foot ulcers. *Plast Reconstr Surg*, 2006, 117:193-209.
6. Bus SA, van Netten JJ, Lavery LA, et al. IWGDF guidance on the prevention of foot ulcers in at-risk patients with diabetes. *Diabetes Metab Res Rev*, 2016, 32:16-24.
7. American Diabetes Association. *Foot Care in Patients With Diabetes Mellitus*. *Diabetes Care*, 1998, 21:54-55.
8. Pollock RD, Unwin NC, Connolly V. Knowledge and practice of foot care in people with diabetes. *Diabetes Res Clin Pract*, 2004, 64:117-122.
9. Desalu OO, Salawu FK, Jimoh AK, Adekoya AO, Busari OA, Olokoba AB. Diabetic foot care: self reported knowledge and practice among patients attending three tertiary hospital in Nigeria. *Ghana Med J*, 2011, 45:60-65.
10. Hasnain S, Sheikh NH. Knowledge and practices regarding foot care in diabetic patients visiting diabetic clinic in Jinnah Hospital, Lahore. *J Pak Med Assoc*, 2009, 59:687-690.
11. Saeed N, Zafar J, Atta A. Frequency of patients with diabetes taking proper foot care according to international guidelines and its impact on their foot health. *J Pak Med Assoc*, 2010, 60:732-735.
12. Agha SA, Usman G, Agha MA, et al. Influence of socio-demographic factors on knowledge and practice of proper diabetic foot care. *Khyber Med Univ J*, 2014, 6:9-13.
13. Goie TT, Naidoo M. Awareness of diabetic foot disease amongst patients with type 2 diabetes mellitus attending the chronic outpatients department at a regional hospital in Durban, South Africa. *Afr J Prim Health Care Fam Med*, 2016, 8:1.
14. Ahmed SA, Badi S, Tahir H, Ahmed MH, Almobarak AO. Knowledge and practice of diabetic foot care in Sudan: A cross sectional survey. *Diabetes Metab Syndr*, 2019, 13:2431-2435.
15. Al-Khaldi YM. Foot care among male diabetics in family practice center, abha, saudi arabia. *J Family Community Med*, 2008, 15:103-106.
16. Khamseh ME, Vatankhah N, Baradaran HR. Knowledge and practice of foot care in Iranian people with type 2 diabetes. *Int Wound J*, 2007, 4:298-302.
17. Viswanathan V, Shobhana R, Snehalatha C, Seena R, Ramachandran A. Need for education on footcare in diabetic patients in India. *J Assoc Physicians India*, 1999, 47:1083-1085.
18. Seid A, Radie Y. Knowledge, Practice, and Barriers of Foot Care among Diabetic Patients Attending Felege Hiwot Referral Hospital, Bahir Dar, Northwest Ethiopia. *Advances in Nursing*, 2015.

19. Premkumar R, Rajan P, Rima J, Richard J. Footwear in the causation and prevention of foot ulcers in diabetes mellitus. *The National Medical Journal of India*, 2017, 30:255-261.
20. Fletcher J. Full nursing assessment of patients at risk of diabetic foot ulcers. *Br J Nurs*, 2006, 15:18-21.