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Diabetic Foot Care Knowledge, Practice and Treatment Adherence among Diabetic Patients Attending Urban Health Centre, Chidambaram, Tamilnadu

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Abstract | **Original Research Article**

Diabetes Mellitus is the emerging epidemic causing a major impact on morbidity and mortality of people throughout the world. Diabetes mellitus is associated with many complications of which Diabetic foot is one of the most significant and devastating complications, which is the leading cause of admission, amputation and morbidity & mortality in diabetic patients. Proper foot care will prevent the diabetic foot and the main goals of diabetic foot care involve a combination of preventive strategies, including patient education, involvement, and adherence to physician recommendations, as well as maintaining tight glycemic control and performing routine skin, foot, and nail inspections. Good knowledge and practice regarding diabetic foot care will reduce the risk of diabetic foot complications and ultimately amputation. The present study was conducted to assess the level of knowledge and practice of the diabetic patients on foot care and also to examine the association among knowledge and practice of foot care and adherence to the treatment by the diabetic patients in a facility based setting. A pre tested semi structured interview schedule was used to collect the data and the adherence to medication was assessed using Morisky 4 point adherence scale. A total of 193 patients were enrolled for the study. It was found that the Knowledge and practice of foot care in the majority of diabetic patients were moderate (52.3% and 56.5 % respectively). Majority (63.7%) of the participants showed high level of adherence to diabetic medications. There was a positive correlation found between the knowledge and practice levels of foot care (r- 0.355; $p<0.05$).Hence the Diabetic patients should be given health education about the preventive aspects of foot care which enhances the knowledge level thereby promoting the practice of effective foot care and prevention of diabetic foot .

Keywords: Diabetes Mellitus, Diabetic Foot, Footcare, Adherence, Morisky scale, Chidambaram.

INTRODUCTION

Diabetes mellitus (DM) is a major systemic disease affecting 415 million people in the world. It is increasing at an alarming rate and will become an epidemic in next few years[1]. India is home to 69.1 million patients with diabetes mellitus with an overall prevalence of 9.3%[2]. One in every fifth diabetic individual on the earth is an Indian. According to International Diabetes Federation (IDF) estimates, the number of diabetics in India is expected to increase from 51 million [2010] to 87 million by 2030[3]. The increase in prevalence of diabetes mellitus (DM) is being associated with many complications among diabetic patients. Diabetic foot is one of the most significant and devastatingcomplications of diabetes, and is defined as a foot affected by ulceration that is associated with neuropathy and/or peripheral arterial disease of the lower limb in a patient with diabetes[4]. Foot complications are a leading cause of mortality in developing countries [5]. The lifetime risk of foot ulcer among diabetics is 15% and specifically 8% among rural diabetics [3]. These complications constitute an increasing public health problem and are a leading cause of admission, amputation and mortality in diabetic patients [6]. The main goals of diabetic foot care involve a combination of preventive strategies, including patient education, involvement, and adherence to physician recommendations, as well as maintaining tight glycemic control and performing routine skin, foot, and nail inspections [4]. Good knowledge and practice regarding diabetic foot care will reduce the risk of diabetic foot complications and ultimately amputation [7]. People with DM who wish to live a normal life, needs to have knowledge about their

illness and the management of DM. Knowledge is the greatest weapon to fight against diabetes mellitus. Proper education and guidance of the patients will show significant improvement in the management of diabetes [8]. In this context, patient understands about diabetic foot complications, foot care practices and adherence to medication are imperative for effective management of diabetes.

With this background, this cross sectional study was undertaken in the Urban Health Centre, Department of Community Medicine, Rajah Muthiah Medical College, Annamalai University, Tamilnadu. The association of knowledge on foot care with practice of foot care and adherence to medication are discussed in this article.

Objectives

The study was carried out to find out the level of knowledge and practice of the diabetic patients on foot care and also to examine the association among knowledge and practice of foot care and adherence to the treatment by the diabetic patients in a facility based setting.

MATERIALS AND METHODS

This facility based cross sectional study was carried out among the diabetic patients attending Urban Health Centre, Department of Community Medicine, Rajah Muthiah Medical College, Annamalai University, Tamilnadu, during the month of September 2016. Convenience sampling method was adopted.

Inclusion criteria

All diabetic patients attending the Urban Health center with age above 30 years and who were diagnosed atleast a year before were included in the study.

Exclusion criteria

Diabetic patients with foot complications and gestational diabetes patients were excluded from the study.

Data collection

Data collection was carried out using a pre-tested, semi structured interview schedule. Data on socio-demographic factors, details on diabetes and co-morbid conditions were collected.Knowledge and practice with regard to foot care were assessed with 14 questions on knowledge and 14 questions on practice. This was based on the questionnaire used by Sofia Hellenberg and Stina Thunberg[9]. Adherence to diabetic medication was measured using Morisky 4 point Medication Adherence scale through recall method.

Scoring and interpretation

Morisky adherence scale consists of 4 questions with yes/ No responses. Each Question was assigned a score of 1.When the scores are low, higher the adherence. Adherence to the medication was taken as good if the total score is 0 and poor when the scores are 3 or 4. Scores 1&2 were considered as intermediate adherence.

Knowledge on foot care wasclassified as good if the score is above 70% (10 -14), satisfactory with a score of 50 - 69% (7-9) and poor with a score of less than 50% (< 7). Practice on foot care was classified as good if the score is above 70% (10 -14), satisfactory with a score of 50 - 69% (7 -9) and poor with a score of less than 50% (< 7).

Data analysis

The data were analysed using SPSS software for windows [Statistical Package for Social Sciences] version 20. Independent variables include socio-demographic factors, knowledge on foot care and dependent variables are practice of foot care and adherence to medication. Frequency distributions of the variables were obtained and Chi Square testswereapplied to study the association among the independent and dependent variables. P value less than 0.05 was considered as statistically significant.

RESULTS

In this facility based cross sectional study, 193 participants were enrolled. Out of 193patients, 129 (66.8%) patients belonged to the age group51-70 years, 31 (30.6%) patients were from the age group31-50 years and 5 (7.8%) patients were aged 71 years andabove. Among the subjects, 129 (66.8%) were female and 64 (33.2%) were female.

Among the subjects, 35.2 5 belong to 60 years and above followed by (34.2)51-60 years. Females constitute 66.8 %. 81.8% of them are married. A majority 43% have had primary level education followed by middle schooling. A majority, 58.5% are involved in sedentary work followed by (30.1) heavy work. 51.3% of the subjects have had monthly income from 5000 to 10000.

Table-1: Classification of the subjects on the basis of socio – demographic variables, family history and duration of disease. (Number=193)

Variables		Frequency	Percentage
Age	31 -50 Years	59	30.6
	51 – 60 Years	66	34.2
	Above 60 Years	68	35.2
Sex	Female	129	66.8
	Male	64	33.2
Marital Status	Married	157	81.3
	Widow/er	36	18.7
Education	Illiterate	28	14.5
	Primary	83	43.0
	Middle	49	25.4
	High School	40	21.6
Nature of Work	Sedentary	113	58.5
	Moderate	22	11.4
	Heavy	58	30.1
Income	<5,000	40	20.7
	5,000 – 10,000	97	50.3
	>10,000	56	29.0
Family History of Diabetes	Yes	50	25.9
	No	143	74.1
Duration of Diabetes	1 -5 Years	148	76.7
	6 – 10 Years	35	18.1
	11 Years and above	10	5.2

Table-2: Knowledge of the Respondents on Foot Care. (The values indicate correct answers)

Foot Care Knowledge Items	Presence of Knowledge (N=193)
1.Importance of taking anti-diabetes treatment	168 (87)
2.Daily washing the feet	177 (91.7)
3.Using warm water for washing	66 (34.2)
4.Checking temperature of warm water	58 (30.1)
5.Drying the feet after washing	109 (56.5)
6.Talcum power usage for keeping inter-digital space	27 (14.0)
7.Keeping skin of the feet soft to prevent dryness	65 (33.7)
8.Lotion not to be applied in the inter-digital spaces	77 (39.9)
9.Trimming nails of feet straight with care	183 (94.8)
10.Inspection of feet once a day by yourself	149 (77.2)
11.Wearing comfortable foot wears	172 (89.1)
12.Checking the footwear from inside before wearing	95 (49.2)
13.Not walking bare foot	141 (73.1)
14.Warning signs for which consultation is required	87 (45.1)

Individual question wise analysis of the knowledge has revealed that a majority of the subjects have had correct knowledge on trimming of nails (94.8) followed by washing the feet daily(91.7%), wearing of comfortable shoes (89.1%), importance of anti-diabetic treatment (87%) and bare foot walking(73.1%).

Table-3: Levels of Knowledge and Practice of respondents on foot care (Number=193)

Variable	Category	Frequency	Percentage
Knowledge	Inadequate	46	23.8
	Moderate	101	52.3
	Adequate	46	23.8
Practice	Inadequate	54	28.0
	Moderate	109	56.5
	Adequate	30	15.5

A majority (52.3% and 56.5%) were found to have moderate levels of both knowledge and practice of foot care.

Table-4: Foot Care Practice of the Respondents. (The values indicate correct answers)

Foot Care Practice Items	Practice (N=193)
1. Do you examine your feet?	145 (75.1)
2. Do you wash your feet every day?	180 (93.3)
3. Do you dry well between the toes?	85 (44.0)
4. Do you use a moisturising cream on your feet?	18(9.3)
5. Do you cut your toe nails by yourself?	169 (87.6)
6. Do you ever soak your feet?	155 (80.3)
7. Do you always test water temperature before your foot in?	35 (18.1)
8. Do you use medicated products for warts, corns or calluses?	140 (72.5)
9. Do you put moisturising creams or lotions between your toes?	33 (17.1)
10. Do you ever walk around in bare foot?	113 (58.5)
11. Kind of footwear used?	154 (79.8)
12. Do you use a hot water bottle or heating pad on your feet?	158(89.9)
13. Do you sit with your legs crossed for long time?	124 (64.2)
14. Do you think you have taken care your feet in correct way?	105 (54.4)

As regards practice related to foot care, a majority of the subjects have reported correct practice in washing the feet daily (93.3%) followed by not using heating pad on feet(89.9%), toe nail cutting by self(87.6%), not soaking feet (80.3%), foot wear use (79.8%),examination of feet every day (75.1%) and not using medicated products for warts, corns(72.5&).

Table-5: Adherence to medication of respondents (Number=193)

Adherence	MMAS Score	Frequency	Percentage
High	0	123	63.7
Medium	1 -2	59	30.6
Low	3 -4	11	5.7

A majority (63.7%) were found to have good level of adherence to the Diabetic medication.

Table-6: Correlation between knowledge and practice of foot care

Variable	Practice	Significance
Knowledge	0.355**	0.000
Adherence to medication	-0.023	0.754
Duration of Diabetes	0.90	0.214
Family History	-0.061	0.396

** Correlation significant at 0.01 levels

Examining the relationship among the independent variables knowledge, adherence to medication, duration of diabetes and family history with the dependent variable practice, it was found that only the knowledge of the subjects had significant positive relationship with the practice.

DISCUSSION

This facility based cross sectional study was done to assess the association between knowledge on foot care with practice of foot care and medication adherence. Diabetic patients in the study were nearly equally distributed in all the age group i.e 30.6 % , 34.2 %, 35.2 % in 31-50 years, 51-60 years, or more than 60 years respectively. This shows the higher prevalence of diabetes in the community among the population of age more than 30 years without any difference in the age group.

But the Majority of the study participants were diabetic for less than 5 years. This can be due to the fact that the patient with diabetes for longer duration might have opted for higher centres or private practioners for their continued treatment.

Only 23.8% of the respondents had adequate knowledge about foot care and a majority (56.5%) of them had moderate knowledge about it. This observation was similar to the study done in Pakistan where only 29.3% of the study participants had adequate knowledge about the foot care [10].

Regarding the knowledge about individual foot care measures, about 87% had knowledge about the importance of taking treatment. This was similar to the observation of Sutaria PK *et al.* In Ahmedabad [1] which is about 90 %. Knowledge about washing the feet regularly, trimming of nails with care, wearing comfortable foot wears were found nearly 90 %. Similar study done by AR Muhammad-Lutfi, *et al.* in Malaysia showed 93. 6% knowledge about washing the feet regularly [11]. But, the knowledge regarding trimming the nails with care and wearing comfortable foot wears were lesser than current study at 53.5 % and

73.75 % respectively. Knowledge about bare foot walking is nearly 73 % in this study. The studies done by AR Muhammad-Lutfi *et al.* in Malaysia and Seemahasnain in Lahore showed bare foot walking at 83 % and 77 %respectively [10,11]. The Knowledge regarding other aspects of foot care was found varying significantly in this study when compared to studies in different regions.

Regarding the foot care practices, only 15.5 % had adequate foot care practices and 56.5% had moderate level of foot care practice. This result was similar to the study by Seema Hasnain where only 14% of respondents had good practices for foot care, and 54% had satisfactory practices [11].

The Practice of foot care is higher for those aspects in which the patients had better knowledge. This is shown by the findings that practice of washing the foot daily, trimming the nails by themselves, wearing foot wears were higher at 93.3%, 87.6% & 79.8%, respectively which had more than 90 % knowledge among the study participants. This is in contrast to the findings of AR Muhammad-Lutfi *et al.* and Seemahasnain [10, 11]. Walking with bare foot for which even though patient had 73% knowledge it was practiced by only 58.5% of the participants. This can be due to the socio economic reasons which can contribute to this difference. This difference was also seen in the study done by AR Muhammad-Lutfi, *et al.* in Malaysia [11]. The other practices about foot care for which the individuals had lesser knowledge lower practice was observed. Similarly 63.7 % of the study participants had good adherence to diabetic medications which reflects the patient's knowledge on the importance of taking regular anti diabetic medications for the prevention of complications.

This relation between the Knowledge and practice regarding foot care was found correlated statistically with a significant p value [$p < 0.05$]. A study done by Jinadasa CVM in Srilanka showed a statistically significant difference between knowledge and practice of foot care [12]. O.O.Desalu *et al.* also observed that patients with poor practice had a poor knowledge about foot care [6]. No statistically significant relation was found between the practice of foot care with adherence to medication, Duration of diabetes or with family history of diabetes. The study done by Sutaria PK *et al.* showed a significant association between duration of diabetes and knowledge and practice of foot care [1]. The contrasting result can be due to the fact that majority of the participants in the study was with duration of diabetes less than 5 years.

The main limitation of the study is that it was conducted in a health care institution setting and the knowledge and practice information among the patients in the community was not assessed. The information about the practices has been collected from the patients that had a chance of recall bias.

CONCLUSION

The study showed that the knowledge and practice of foot care in the majority of diabetic patients who were attending the OPD were moderate and not adequate to prevent the diabetic foot complications. There was a positive correlation found between the knowledge and practice levels of foot care. Effective communication and health education regarding the foot care can bring about a significant change in the knowledge level thereby promoting the practice of effective foot care and prevention of diabetic foot among the patients.

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