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## Knowledge and Practice to Foot Care and Prevalence of Foot Infection Among Diabetes Patients in Bangladesh

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### ABSTRACT

This study is a descriptive type of cross sectional as well as qualitative study, which is conducted among the diabetic patients of BIRDEM Hospital, Dhaka. The main objective was to assess knowledge and practice about foot care and prevalence of foot infection among the diabetic patients. 100 patients were purposively chosen, face to face interview through a questionnaire along with infected foot examination through an examination check list was done. A clear relationship was established among educational statuses, monthly income, foot care education and diabetic with foot infection. Higher education decreases in prevalence of foot infection; higher monthly income family experienced more prevalence than others did; foot care education earlier reduces the development of foot infection, increase of suffering from diabetic increase the development of foot infection. The development of foot infection increases with the walking bare foot; habit of seat near fire/heater and with the habit of ever have examined feet by doctor. This study emphasizes the need of provision of foot care education. Health care workers should attempt to give their diabetic patients necessary health education about foot care in order to reduce the burden of foot complications among diabetic patients.

### INTRODUCTION

Foot infections in persons with diabetes are a common, complex, and costly problem. Foot infections in patients with diabetes cause substantial morbidity and frequent visits to health care professionals and may lead to amputation of a lower extremity. Diabetic foot infections require attention to local (foot) and systemic (metabolic) issues and coordinated management, preferably by a multidisciplinary foot care team. The team managing these infections should include, or have ready access to, an infectious diseases specialist or a medical microbiologist. The major predisposing factor to these infections is foot ulceration, which is usually related to peripheral neuropathy. Peripheral vascular disease and various immunological disturbances play a secondary role. People with diabetes must be fully aware of how to prevent foot problems before they occur, to recognize problems early, and to seek the right treatment when problems do occur. Although treatment for diabetic foot problems has improved, prevention - including good control of blood sugar level - remains the best way to prevent diabetic complications. People with diabetes should learn how to examine their own feet and how to recognize the early signs and symptoms of diabetic foot problems. They should also learn what is reasonable to manage routine at home foot care, how to recognize when to call the doctor, and how to recognize when a problem has become serious enough to seek emergency treatment. The complications or consequences of skin infection in the diabetic foot are the development of further ulceration or abscesses, the spread of infection to elsewhere in the foot and leg associated with cellulites and fasciitis, and the development of Osteomyelitis.

In addition, these infections may be complicated by septicemia which can sometimes be life-threatening. The organisms of infection are derived from the common of skin flora of the foot. In order of frequency these are *Staphylococcus aureus*, *Streptococcus pyogenes* and anaerobic bacteria of various species. (The skin has a normal anaerobic flora, and these are responsible for the cheesy smell of dirty feet). Fungi may also cause infection, and any other organism that contaminates this site may on occasion be involved, especially coliform organisms from the bowel. The treatment of infection of the diabetic foot should be aggressive, because of the slow response to therapy and the potential development of serious complications. As always, the initial treatment of skin, bone and soft-tissue sepsis is surgical debridement of dead and infected tissue, drainage of pus and cleaning of the affected area. It is advisable to check the G6- PD status of the male patients before starting treatment with co-trimoxazole. The common staphylococcal infections are best treated by specific therapy with cloxacillin or, in penicillin-hypersensitive patients, erythromycin. In serious staphylococcal infections Fucidin should be added, but this drug should not be used alone because of the rapid development of resistance with Fucidin monotherapy. All these drugs are relatively cheap and available as oral as well as parenteral preparations. Since the complications of foot infections may be serious, long-term preventative measures are important, and should be, directed towards correcting the underlying problems. Firstly the diabetes should be kept under control, since this does appear to reduce the incidence and severity of infections and secondly, a proper program of foot care and chiropody should be established, with early attention

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to the appearance of wounds or ulcers. The objective of this study is to assess knowledge and practice about foot care as well as prevalence of foot infection among diabetic patients of the BIRDEM, the Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders in Bangladesh.

### Background of the study

The importance of foot care cannot be denied in diabetic patients. The lifetime prevalence of foot ulceration in patients with diabetes is about 15% and the most frequent component causes for lower- extremity ulcers are trauma, neuropathy, and deformity, which are present in majority of patients. The patient plays a crucial role in the prevention of diabetic foot disease and therefore education regarding foot care is important. Patients are more likely to comply with a treatment regimen when they have sufficient knowledge about their medical condition. Magnitude of diabetes mellitus in Bangladesh is increasing. Several epidemiological studies in migrant population in UK and USA has also reported that Bangladeshi people among the entire south Asian immigrant have the highest mortality and attack rate from diabetes and coronary heart disease. The prevalence rate of diabetes in Bangladesh in 2003 was 3.9% and that of IGT was 7.1%. In Bangladesh 2.8 % of total diabetic have foot prevalence. In Bangladesh DM and its complications are increasing rapidly. In BIRDEM hospital, DM registered patients were 425260, IGT 37372 and GDM were 6304 and daily turnover is around 2500. Daily an average 80 new diabetic patients have been registered. A big part of the population is suffering from this multi-organ affected disease. Though amputation of limb due to ulceration reached a remarkable point but there was no research work done in Bangladesh except prevalence study. Now a day's foot care department of BIRDEM is doing research work on diabetic foot infection which is ongoing process

Foot care knowledge and behavior of patients seems positively influenced by patient education in the short term. In Pakistan, majority of patients with diabetes does not pay proper attention to their feet. An important reason of this attitude is that patients are not provided with foot care education and therefore remain unaware of the adverse consequences of neglect. Improper foot care leads to many complications that may result in ulcerations and eventually amputations. Corns and calluses can be caused by mechanical stresses from poorly fitted shoes. Similarly, the practice of keeping the foot wet predisposes to fungal infections which may lead to cellulitis. To assess the actual magnitude of the problem, it is important to document foot care behavior.

Foot ulceration and infections are perhaps the most frequent and serious complication of diabetes mellitus (DM). The annual incidence of leg and foot ulcers is 2, 6.5 and 33 times more common than diabetic coronary disease, stroke and renal failure respectively. About 15% of diabetic patients develop a foot ulcer during their lifetime and 20% suffer from some type of foot infection

in their lifetime. Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders (BIRDEM), a central referral hospital in Dhaka city, provides basic diabetes care to a large number of diabetic populations. A retrospective cohort study from 1980 to 1995 among patients in BIRDEM showed a 2.8% prevalence of diabetic foot ulcer. Many studies have reported on the bacteriology of diabetic foot infection over the past 25 years, but the results have varied and have often been contradictory. Diabetes is a global public health problem. With current trends prevailing, the number of affected individuals is likely to more than double in the next two decades. People with diabetes need more than medical treatment from their health-care providers: they also need support in mastering and sustaining complex self-care behaviors that enable them to live as healthily as possible. The number of people with diabetes is increasing due to population growth, aging, urbanization, and increasing prevalence of obesity and physical inactivity.

One of the commonest complications of macro vascular disease is diabetes mellitus. Peripheral vascular disease is firstly shown on lower extremities as infection on foot. From this infection other complication such as ulceration, amputation, gangrene etc. arises. Tissue damage due to ischemia and loss of sensation is present. Maximum diabetic patient ignores their foot. Actually, no body take care their feet and legs. In case of diabetic sugar level is high in blood organism grow rapidly, so that ulcer infection turns to gangrene. And the individual becomes burden on his family. In fact, awareness about foot care, foot ware, controlling sugar level, depends on effective health education by a nurse/health educator.

Now a day's science and technology are going advance day by day. Medical science also changes rapidly, and it plays an important role for promotion of health and prevention of disease, especially in case of diabetes and its complications. Majority of people called it a silent killing disease. So there is need to good control and keeping a target level of blood glucose. By the philosophy of late national professor Dr. Md. Ibrahim, "Diabetic patient will never die untreated". So patient have right to lead a normal independent life while having diabetes. If they have knowledge and do practice, they never become disabling. So, the diabetic patients can lead better life independently. In the field of treatment and follow up there is an important relationship between nurse and patients. Nurses are doing their ethical work toward patient including health education and also follow a check list. In accordance with education, proper guidance and take care it will hasten recovery and lessen complication. In view of development, the governing bodies of WHO both a global and regional level have recommendation prevention of disease, prevention of diabetes and to lessen its mortality and morbidity rate through as number of activities, including research and teaching [18]. In this study the research tried to find out the extent of knowledge and practice of diabetic patient's follow-up to

what extent they maintain the disciplined life

## METHODOLOGY

### Study Design

This study was a descriptive type of cross sectional as well as qualitative type study conducted among the diabetic patients.

### Study place

The study place was outdoor of BIRDEM Hospital, Dhaka

### Study period

The study was conducted between June to December 2011.

### Study population and Unit of Analysis

The study population is patients with diabetic registered at BIRDEM hospital. More than 4,00,000 diabetic patients have been registered so far with average 80 new patients getting registered daily at BIRDEM hospital.

### Sample size

The sample size was purposively fixed at 100 diabetic patients only.

### Sampling technique

A purposive random sampling technique was used.

### Research tools

A structured and open-ended questionnaire was developed which included various information regarding socio-demographic status of registrar patients suffering from diabetic as well as information regarding their foot care practice, food habit, prevalence of diabetic etc. Further through a check list their foot care and foot infection status was examined to find out infection of foot.

### Data collection method

After explaining the purpose of the study Data were collected through face to face interview using the questionnaire (Annex-1). After interview session, foot infection was examined as well as a check list was filled up to get all information of respondents.

### Conduction of the study, Quality control and monitoring

The investigator herself collected data from BIRDEM hospital. The collected data were checked and verified by the investigator at the end of each working day. Any inaccuracy and inconsistency were corrected in the next working day. For ethical purposes foot care education was also promoted among unaware diabetic patients who participated in the study.

### Data processing and Statistical analysis

Data was analyzed by using Microsoft Excel. Simple frequency distribution tables were generated for dependent and independent variables. Chi-square test was applied to find out whether there is any statistically significant effect of socioeconomic factors on knowledge and practices regarding foot care in diabetics as well as significant effect of proper foot care on prevalence of foot infection. Seventeen questions each were asked regarding knowledge and practices of foot care. Each correct answer was given one mark.

### Inclusion Criteria

- Patients with diabetic registered at BIRDEM hospital
- Willing to participate in the study

### Exclusion Criteria

- He exclusive criterion for subjects' selection was having no diabetic.
- Unwilling to participate in the study

### Ethical consideration

Prior to the commencement of this study, the research protocol will be approved by the research committee of ADUST. The objective of the study along with its procedure, risks and benefits of this study was explained to each participant. Then it was assured that all information and records will be kept confidential, and the procedure will be used only for research purpose and the findings was helpful for developing awareness package to improve the quality of care of the patients about Diabetic in the hospitals in Bangladesh.

### Informed Consent

A well and clearly understood inform consent form will be filled in up by the respondents and interviewer. However, translations were carried out after the according to the need of the respondents. This ensures that each of participants will get the information they need to make an informed decision.

## RESULTS

The results from questionnaire surveys on knowledge and practice to foot care of diabetic patients are described as follows

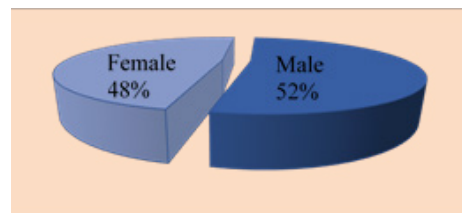
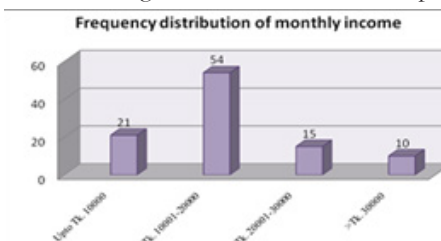


Figure 1: Frequency Distribution of Respondent's Gender:

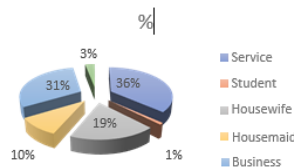
Among the respondents having diabetic male was numerically about equal to female. 52 percent of 100 respondents were male whereas 48 percent were female at Dhaka Diabetic Hospital, Dhaka.

About half of the total respondent's family's (54) monthly earnings were between tk. 10000-20000. Whereas one fifth (21) family were living with monthly income of below Tk. 10000. Other 15 respondent's family were earning monthly between Tk. 20000- 30000 and rest 10 respondents earning were more than tk. 30000 per month.



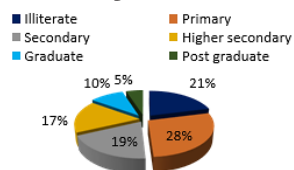
**Figure 2:** Distribution of the respondents by their monthly income

Out of 100 respondents 62% were single family whereas joint and extended family were 32 and 6% respectively



**Figure 3:** Distribution of the respondents by occupation. The illiterate was 21 whereas the graduate graduate education level were 10 and 5 respectively

Among the total respondents only 6% inspect their foot daily. Among the total respondents 16% wash their



**Figure 4:** Frequency Distribution of Respondent's

Among the total respondents only 6% inspect their foot daily. Among the total respondents 16% wash their foot once daily whereas 74% wash their foot multiple times in a day. Among the total respondents 19% dry their foot properly after every wash whereas 81% do not dry their foot properly after every wash. Among the total respondents only 7% apply emollients to their foot whereas 93% do not apply emollients to feet dry their foot. Among the total respondents only 14% wearing shoes after checking whereas 86% don't wearing shoes after checking them.

Among the total respondents only 10% wearing cotton socks whereas 90% don't wearing cotton socks. About half 49 of the respondents walked usually bare foot whereas another half 51 don't walk bare foot. About one fourth of the respondents 25 wear fitting, low heels leather shoe whereas three fourth 75 don't wear fitting, low heels leather shoe. About one fifth of the respondents 20 trim their nail properly whereas four fifth 80 don't trim their nails properly. Among the total respondents 5 treat themselves their foot whereas 95 respondents don't treat themselves their foot. Among the total respondents only 6% inspect their foot daily. Among the total respondents 40 ever have examined feet by doctor whereas 60 don't ever have examined feet by doctor.

Among the total respondents 20 have compliant with anti-diabetic treatment whereas 60 don't have any compliant with anti-diabetic treatment. Majority 77 of the respondents were not smoker whereas 23 were smoker. Among the total respondents 38 regular follow-up as on dated whereas 62 respondents don't regular follow-up as on dated. Among the total respondents 10 have any diabetic foot care related education earlier whereas 90 don't have any diabetic foot care related education earlier. The knowledge and practices regarding foot care was marked difference for most of the questions asked. However, there were approximately same for washed feet

daily, using hot water for washing/bathing, daily change of socks

**Table 1:** Distribution of Foot Care knowledge and Practices (n=100)

Sl. No.	Questions asked to determine the knowledge and practices regarding foot care	Knowledge	Practices
1	Inspect feet daily	16	6
2	washed feet daily	95	94
3	Drying the feet properly after washing	54	19
4	Patients who applied emollients to their feet	33	7
5	Checked shoes before wearing	54	14
6	wore cotton socks	51	10
7	Not walking bare feet	77	49
8	Trimming nails properly (straight, leaving edges)	60	20
9	wore correct fitting, low heel leather shoes	36	25
10	Self-treated foot for problems like corns, callosities and trauma	46	5
11	Using hot water for washing/bathing	57	50
12	Ever had foot examination by a doctor	71	29
13	Compliant with anti-diabetic treatment	31	20
14	Regular follow-up as on dated	62	38
15	Daily physical exercise	56	26
16	have any diabetic foot care related education earlier	88	10
17	Daily change of socks	33	27

**Table 2:** Percentage scoring of knowledge and practices about foot care among the respondents

Scoring (Out of 16)	Knowledge	Practice
> 70% (Good) (12-17)	28	15
50-70% (Satisfactory) (8-11)	41	39
< 50% (Poor) (Less than 8)	31	46
Total	100	100

Among the 100 respondents 28 % had the good knowledge whereas only 15% had the good practice regarding foot care. Satisfactory knowledge and practice were 41% and 39% respectively whereas among the total respondent had 31% and 46% knowledge and practice regarding foot care respectively

## CONCLUSION

In this study, awareness of foot care measures is poor among known diabetic patients, and this is largely due to a lack of education of the patients by their health care providers. Selection of appropriate footwear is important and requires patient's education. Usually, patient's priorities about footwear selection are dependent on social, cultural and climatic conditions. It showed that only 38% patients with diabetes were taught about foot care methods. They remained ignorant about the importance and methods of foot care even after hospitalization for foot infections<sup>30</sup>. The present study emphasizes the need of provision of foot care education as well. A clear relationship was found between taken foot care education earlier and development of foot infection. As earlier foot care education might reduce the development of foot infection. Machine learning models will be developed on foot care among diabetic patients in future research

## Recommendation

Foot problems are a major cause of morbidity, disability, as well as emotional and physical costs for people with diabetes. Early recognition and management of independent risk factors for ulcers and amputations can prevent or delay the onset of adverse outcomes. This position statement provides recommendations for people who currently have no foot ulcers and outlines the best means to identify and manage risk factors before a foot ulcer occurs or an amputation becomes imminent.

- All individuals with diabetes should receive an annual foot examination to identify high-risk foot conditions. This examination should include assessment of protective sensation, foot structure and biomechanics, vascular status, and skin integrity.

- Blood glucose of diabetic patients should be kept under control to avoid foot problem.
- Individual foot care and health care education is a must.
- An intensive health education program should adapt to improve the foot care knowledge and behavior of high-risk diabetic patients.

- Mass awareness program should perform in the Mass Media for importing patient education.

- A manual for patient's education on foot care should prepare and serve to all concerned. public, private and foreign hospitals. A machine

## REFERENCE

A. Hadadi, H. O. Ghiasi, M. Hajiabdolbaghi, M. Zandekarimi, and R. Hamidian, (2014), "Diabetic foot: Infections and outcomes in Iranian admitted patients," *Jundishapur J. Microbiol.*, doi: 10.5812/

jjm.11680.

NDIC, "Prevent diabetes problems: Keep your feet healthy," Nih, 2009.

G. R. Tennvall, J. Apelqvist, and M. Eneroth, "Costs of deep foot infections in patients with diabetes mellitus," *Pharmacoeconomics*, 2000, doi: 10.2165/00019053-200018030-00003.

J. J. Mendes and J. Neves, "Diabetic Foot Infections: Current Diagnosis and Treatment," *J. Diabet. Foot Complicat.*, 2012.

K. A. Abdul Kadir, M. Satyavani, and K. Pande, "Bacteriological study of diabetic foot infections," *Brunei Int. Med. J.*, 2012.

Mohammed Ashikur, Rahman et al., (2016), "Socio-demographic Characteristics & Pattern of Disease among Patients attending in Alternative Medical Care. A Cross-sectional Analysis Bangladesh Journal of Public," *Bangladesh J. Public Heal.*, 1(1), 59–61.

F. Crawford, M. Inkster, J. Kleijnen, and T. Fahey, "Predicting foot ulcers in patients with diabetes: A systematic review and meta-analysis," *QJM*, 2007, doi: 10.1093/qjmed/hcl140.

F. L. Bowling, S. T. Rashid, and A. J. M. Boulton, "Preventing and treating foot complications associated with diabetes mellitus," *Nature Reviews Endocrinology*, 2015, doi: 10.1038/nrendo.2015.130.

B. G. Fincke, D. R. Miller, and R. Turpin, "A classification of diabetic foot infections using ICD- 9-CM codes: Application to a large computerized medical database," *BMC Health Serv. Res.*, 2010, doi: 10.1186/1472-6963-10-192.

P. Y. Liu, Z. Y. Shi, and W. H. H. Sheu, "Diagnosis and treatment of diabetic foot infections," *J. Intern. Med. Taiwan*, 2012, doi: 10.7547/0950183.

N. Amin and J. Doupis, "Diabetic foot disease: From the evaluation of the 'foot at risk' to the novel diabetic ulcer treatment modalities," *World J. Diabetes*, 2016, doi: 10.4239/wjd.v7.i7.153.

P. Shanmugam, M. Jeya, and S. S. Linda, "The bacteriology of diabetic foot ulcers, with a special reference to multidrug resistant strains," *J. Clin. Diagnostic Res.*, 2013, doi: 10.7860/JCDR/2013/5091.2794.

S. A. Tabish, "Is Diabetes Becoming the Biggest Epidemic of the Twenty-first Century?," *Int. J. Health Sci. (Qassim)*, 2007.

Z. Gassasse, D. Smith, S. Finer, and V. Gallo, "Association between urbanisation and type 2 diabetes: An ecological study," *BMJ Glob. Heal.*, 2017, doi: 10.1136/bmjgh-2017-000473.

A. Tuttolomondo, C. Maida, and A. Pinto, "Diabetic foot syndrome: Immune-inflammatory features as possible cardiovascular markers in diabetes," *World J. Orthop.*, 2015, doi: 10.5312/wjo.v6.i1.62.

Z. Kaya and A. Karaca, "Evaluation of Nurses' Knowledge Levels of Diabetic Foot Care Management," *Nurs. Res. Pract.*, 2018, doi: 10.1155/2018/8549567.

Y. Wu, Y. Ding, Y. Tanaka, and W. Zhang, "Risk factors contributing to type 2 diabetes and recent advances in



- the treatment and prevention,” *International journal of medical sciences*. 2014, doi: 10.7150/ijms.10001.
- U. Kampmann, “Gestational diabetes: A clinical update,” *World J. Diabetes*, 2015, doi: 10.4239/wjd.v6.i8.1065.
- M. A. Rahman, N. Akter, and S. M. Saleh, “Health Data Mining : Machine Learning Approach,” *Univ. South Asia J.*, 3(1), pp. 89–97, 2017.
- M. A. Rahman and A. Tumian, (Jun. 2019), “Variables Influencing Machine Learning-Based Cardiac Decision Support System: A Systematic Literature Review,” *Appl. Mech. Mater.*, vol. 892, 274– 283, doi: 10.4028/www.scientific.net/amm.892.274.
- M. A. Rahman and T. Rahman, (2017), “Proposed Machine Learning Model to Predict Child Birth Process,” *Univ. South Asia J.*, 3(1), 117–124.
- A. I. L. M. A. R. T. Rahman, (2017), “Mining Weighted Association Rules Using Probabilistic and Combinational Approach,” *Int. J. Sci. Res.*, 6(2), 475–479, doi: 10.21275/ART20163652.
- V. Zamanzadeh, M. Jasemi, L. Valizadeh, B. Keogh, and F. Taleghani, “Effective factors in providing holistic care: A qualitative study,” *Indian J. Palliat. Care*, 2015, doi: 10.4103/0973-1075.156506.
- M. A. Rahman, N. Akter, and S. M. Saleh, (2017), “Health Data Mining : Machine Learning Approach,” *Univ. South Asia J.*, 3(1), 89–97.
- M. A. Rahman and A. Tumian, (Jun. 2019), “Variables Influencing Machine Learning-Based Cardiac Decision Support System: A Systematic Literature Review,” *Appl. Mech. Mater.*, vol. 892, 274–283, doi: 10.4028/www.scientific.net/amm.892.274.
- A. I. L. M. A. R. T. Rahman, (2017), “Mining Weighted Association Rules Using Probabilistic and Combinational Approach,” *Int. J. Sci. Res.*, 6(2), 475–479, doi: 10.21275/ART20163652.
- M. A. Rahman and T. Rahman, (2017), “Proposed Machine Learning Model to Predict Child Birth Process,” *Univ. South Asia J.*, 3(1), 117–124.
- Mohammed Ashikur, Rahman et al., (2016) “Socio-demographic Characteristics & Pattern of Disease among Patients attending in Alternative Medical Care-A Cross-sectional Analysis Bangladesh Journal of Public,” *Bangladesh J. Public Heal.*, 1(1), 59–61.