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Foot care strategy for the newly diagnosed DM Type 2 patients with low educational and socio-economic background: A step towards future

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Abstract

Background and Aims. Diabetic foot ulcer is one of the major health problems that accounts for increased morbidity among the diabetic patients. Having good knowledge, good attitude and practice of managing the foot prevents the impending chronic co-morbidities of the disease.

Materials and Methods. This cross-sectional study was performed to assess the knowledge, attitude and practice on foot care among the newly diagnosed diabetic type 2 patients with low education and socio economic background. This study was conducted in one of the out patient clinics in a tertiary hospital. A set of questionnaire adopted from 'The Michigan Diabetes Research and Training Center' (MDRTC), was used to assess 109 respondents based on their knowledge of diabetes mellitus, practice and attitude towards the condition and care of the feet.

Results. The overall finding on knowledge, practice and attitude had shown unsatisfactory result. There was no relationship between the knowledge, practice and attitude with care of the feet. Only 20 (18.3%) respondents had a high score on knowledge, 31 (28.4%) had practiced good habits and 5 (4.6%) showed positive attitude towards care of the feet. However, there was significant finding on the level of education and the knowledge of foot care (p=0.01);

Conclusion. Strategies should be developed to overcome the long-term complications. As for the Muslim patients, ablution, the ritual practice of washing and cleaning both feet prior to the prayers may be a possible means of checking the feet for any diabetic foot complication.
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Key words: *care, feet, knowledge, practice, attitude, strategy, nursing*

Introduction

Diabetic foot ulcer (DFU) is one of the major health problems that cause increased morbidity among the diabetic patients, and it also accounts for the enormous cost to the healthcare services. DFU is the most common chronic complication other than retinopathy, kidney disease, heart disease or stroke (1-4). The scope of problems of the DFU is so huge that it is reflected by the fact that every thirty seconds, a leg is lost to diabetes somewhere in the world (5). We also found that patients having poor education and in low socio-economic status significantly had lower knowledge of foot care. The association between education and knowledge may be due to the fact that, educated patient were able to read and understand some of educational supportive materials and also use information technology to obtain more information about the disease (5).

The National Health and Nutrition Examination Survey (NHNES 1999-2004) had indicated the prevalence of foot problems as the second highest among all the diabetes-related complications. In Malaysia, Diabetes Mellitus (DM) is one of the commonest conditions affecting the health of aging society associated with multidisciplinary complications. It was estimated that 2.48 million people would be diagnosed as diabetic in Malaysia by the year 2030. An earlier study had revealed a high rate of lower limb amputations with a percentage of 4.3% higher than other common complications such as, strokes dialysis, kidney transplant (6) and numerous studies on the diabetic foot ulcer were carried out to highlight preventive measures and steps taken to avoid the long-term complications (7-9).

Improving patients' knowledge on diabetes through educational efforts could lead more patients to play an active role in obtaining the necessary preventive care and behavior (10). This meant that whenever the patient had been given the knowledge regarding diabetes and management of the foot ulcer, they would be able to involve actively in minimizing the risk of foot ulcer. Some educational program related to diabetic foot care should be implemented to enhance the patient's knowledge on foot care. Education is likely to be effective if one knows the characteristic of the patients' knowledge, attitude and practices (2, 5, 6).

The aim of the present study was to assess the knowledge, practice and attitude on care of the feet among the newly diagnosed DM type 2 patients particularly for the low formal educational and socio-economic background group.

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Materials and Methods

The cross-sectional design was used to assess the knowledge, practice and attitude on foot care among the newly diagnosed DM type 2 patients with low education and socio economic background. It was conducted in one of the outpatient clinics, in one of tertiary hospitals. The respondents comprised the three major ethnic groups, the Malays, Chinese and Indians.

Convenience sampling method was used on newly diagnosed DM type 2 patients with low socio economic and education background. A total 109 respondents participated in the study, of which, 102 were Malays (93.6%), 5 Indians (4.6%) and 2 Chinese (1.8%). Prior ethical approval was obtained from the Ethical Board of the institution (FF-039-2010).

Questionnaire

A structured questionnaire from MDRTC with modification was adopted for the study (11). The instrument represented the social and psychological factors related to diabetes treatment, patients' attitudes and beliefs, self-report on self-care, difficulties encountered on self-care and related demographic information.

The instrument was divided into four sections.

Part A – 12 questions focused on the patients' knowledge on the care of their foot.

Part B – 16 questions focused on patients' attitude on care of the foot.

Part C –10 questions focused on the practices on the care of the foot.

Part D – 8 items on the demographic data.

Data was gathered through 5 Likert's Scale questionnaire, ranging from strongly agree to strongly disagree. The summary scores for Knowledge, Practice and Attitude by MDRTC (11) as for the Knowledge, the high score representing 10 marks and above and less than 10 marks, it was classified as low knowledge. For good practice the score was 13 marks and for poor practice, the mark was less than 13. As for the Attitude component, 8 marks and above was considered as positive Attitude, and less than 8 was classified as negative Attitude.

Statistical analysis

Data analysis was done using SPSS version 16.0 Pearson's correlation to indicate the correlation between variables, Chi-square test was used for categorical data comparison of p value ≤0.05 indicated as significant.

Results

A total of 109 patients from the medical clinics participated in this study over a period of three months, starting from January until April 2009. Table 1 showed the details of the demographic data of respondents. Fifty three (48.6%) were males and 56 (51.4%) were females.

The overall result assessing the knowledge, practice and the attitude of the newly diagnosed DM type 2 patients in this study, was unsatisfactory, as shown in Table 2. For the level of knowledge on DM type 2, only 20 (18.3%) respondents had high score, 31 (28.4%) had good practice in taking care of the feet and only 5 (4.6%) respondents had a positive attitude towards the care of the feet.

Table 1. Demographic Data.

Variables	Frequency	
	n	%
Gender		
Male	53	48.6
Female	56	51.4
Level of Education		
Low		
Primary School	49	45.0
Secondary School	43	39.4
High		
Diploma	8	7.3
Degree	9	8.3
Gross monthly income		
< RM 1000	60	55.0
RM 1000 – RM 3000	40	36.7
>RM 3000	9	8.3

n = 109

Level of knowledge

The detail scoring on the knowledge component was shown in Table 3, the highest score 94 (86.2%) was on the understanding of definition of DM, then followed by 89 (81.7%) respondents knew that good exercise will lower the level in glucose in the body, 71 (65.1%) knew that infection may cause an increased of glucose level in the blood. However, 71 (65.1%) could not associate the lung problems with the risk of diabetes, 68 (78.9%) knew, they should eat more protein if they had flu, 68 (62.4%) had the knowledge that diet low in fat will decrease the risk of heart failure, 67 (61.5%) believed blood testing is the best for blood-glucose result, 66 (60.6%) did not know that baked potatoes had the highest content of carbohydrate, 65 (59.6%) did not know that diabetic diet is the healthy diet

Table 2. Overall Results of The Newly Diagnosed DM Type II Patients on Knowledge, Practice and Attitude.

	N	%
Level of Knowledge		
High	20	18.3
Low	89	81.7
Practice		
Good	31	28.4
Poor	78	71.6
Attitude		
Positive	5	4.6
Negative	104	95.4

N = 109

Table 3.. Detail of Knowledge Component of the Newly Diagnosed DM type 2 Patients towards the Foot Care

	Correct		Wrong	
Knowledge on Diabetes Mellitus Type II Disease	n	%	N	%
A.1) DM disease is a condition where the body contains?	94	86.2	15	13.8
A.2) The diabetes diet is?	44	40.4	65	59.6
A.3) Which of the following is highest in carbohydrate?	43	39.4	66	60.6
A.4) Which is the best method for testing blood glucose?	67	61.5	42	38.5
A.5) For a person in good control, what effect does exercise have on blood glucose?	89	81.7	20	18.3
A.6) Infection is likely to cause?	71	65.1	38	34.9
A.7) The best way to take care of your feet is to?	63	57.8	46	42.2
A.8) Eating foods lower in fat decreases your risk for?	68	62.4	41	37.6
A.9) Numbness maybe is the symptom of?	54	49.5	55	50.5
A.10) Which of the following is **NOT** the risk of diabetes?	71	65.1	38	34.9
A.11) If you have flu, which of the following changes should you make?	23	21.1	86	78.9
A.12) High blood glucose may be caused by?	56	51.4	53	48.6

n = 109

for most people, 63 (58.7%) believed that, the best way to take care of the feet is to inspect it and wash them each day. And 55 (50.5%) respondents had associated numbness as the symptom of nerve damage.

Practice on the Care of the Foot

Table 4 showed the details of respondents' practices on the foot care, 101 (92.7%) respondents cleaned their feet every day and wore shoes that fitted their feet, 98 (89.9%) washed their feet whenever they reached home, 72 (66.1%) inspected their feet everyday but did not clean their feet with warm water, 70 (64.2%) did not wear closed- shoes, 63 (57.8%) did not wear shoes regularly at home and 58 (53.2%) did not inspect their shoes every time before using and only 50 (45.9%) respondents had foot examination during the last visit at the clinic. The overall result of the respondents practice on the foot care was noticeably poor, whereby, only 31 (28.4%) had good practice compared to 78 (71.6%) had poor practice in the care of their feet (Table 2).

Attitude in managing the Diabetes and Care of the feet

Table 5 showed the details of respondents' attitude in managing the disease and care of the feet. One hundred and two (93.6%) admitted that "*I can take care of my foot well without any problems",* 91 (83.5%) were able to handle their feelings with their current condition, however, 76 (69.7%) were worried about the disease, 66 (60.6%) had friends and family to support in planning their meals, 67(61.5%) had friends and family to assist in controlling the blood sugar, 77

Table 4. Detail of Practice Component of the Newly Diagnosed DM type 2 Patients towards the Foot Care.

	Yes		No	
C. Practice on the care of the foot	n	%	n	%
C.1) Do you have your foot examination at the clinic in last month?	59	54.1	50	45.9
C.2) Do you do the self-inspection of your foot at Home every day?	72	66.1	37	33.9
C.3) Do you wash or clean your foot every day?	101	92.7	8	7.3
C.4) Do you wash or clean your every time from Outside?	98	89.9	11	10.1
C.5) Do you wash or clean your foot with warm water?	37	33.9	72	66.1
C.6) Do you wear closed shoes?	39	35.8	70	64.2
C.7) Do your shoes fit to your foot?	101	92.7	8	7.3
C.8) Do you inspect inside of footwear every time before you wear it?	51	46.8	58	53.2
C.9) Do you regularly walk with shoes?	46	42.2	63	57.8
C.10) Do you cut or clear your toe nail with sharp Instrument?	89	81.7	20	18.3

n = 109

Table 5. Detail of Detail of Attitude Component of the Newly Diagnosed DM type 2 Patients in managing the disease and the feet.

	Positive		Negative	
	n	%	n	%
My family or friends help and support me a lot in: B.1a) my meal plan.	66	60.6	43	39.4
B.1b) taking my medicine.	41	37.6	68	62.4
B.1c) taking care of my feet.	32	29.4	77	70.6
B.1d) getting enough physical activity.	36	33.0	73	67.0
B.1e) testing my blood sugar level.	38	34.9	71	65.1
B.1f) handling my feelings about Diabetes Mellitus.	91	83.5	18	16.5
B.2 – I am afraid of my disease.	76	69.7	33	30.3
B.3 – I can take care of my foot well without any problems.	102	93.6	7	6.4
B.4 – I keep my blood sugar in good control.	67	61.5	42	38.5

n = 109

(70.6%) needed support from family and friends in taking care of their feet, 73 (67.0%) had enough physical activity, 71 (65.1%) had family or friends to help in testing their blood sugar level and 68 (62.4%) had family and friends to help in taking medication. Eighty eight (80.7%) respondents claimed that they had eaten too much food that cause the increased in the glucose level, 67 (61.5%) had less activity than usual, 58 (53.2%) were not compliance to medication, 55 (50.5%) developed infection, 49 (45.0%) were stressed, 48(44.0%) had eaten the wrong type of food, and 77 (70.6%) were in denied or upset or even angry when their glucose level raised and 5 (4.6%) respondents had the positive attitude of managing the disease and the care of the feet.

Relationship between knowledge, practice and attitude

Chi-square was used to determine the relationship between respondent's knowledge, practice and attitude towards the management of diabetes mellitus and the care of their feet. Respondents were divided into two groups according to their practices on foot care (Group 1: Poor practice and Group 2: Good in practice) and the relationship between these two categories of practices with the level of knowledge and attitudes towards the care of the feet was determined. The results showed no significant relationship between the knowledge of diseases, practices and the attitude of the newly diagnosed DM with Type II in managing the disease and the care of their feet, p=0.818 and p=0.146 as shown in Table 6.

In Table 7, Chi-square was used to determine the relationship between the level of education and the knowledge on DM type 2 disease among the newly diagnosed DM type 2 patients. The results showed a strong significant relationship between the level of knowledge and the level of education with p=0.001 and n=109.

Discussion

In this study, the overall finding of knowledge, attitude and practice of the newly diagnosed DM type 2 patients and care of the feet were found to be unsatisfactory. More than 50% of the respondents who were newly diagnosed with DM type 2 had little knowledge about the disease and care of their feet and 60(55%) had income < RM 1000 (approximately 232 Euros) per month.

Although, more than 50% of respondents knew what DM was, but they were not aware of the details on the knowledge and practice of the condition. Among 88 (80.7%) respondents had claimed that, they had eaten too much food and more than 50% were not aware of the type of food which may increase the level of glucose. More than 50% of the respondents were not aware that potatoes contained high carbohydrate that can give rise to the glucose level. Therefore, we found that, 77 (70.6%) respondents were not worried or upset when the glucose level was high as they had no knowledge on diabetic diet and the best way of

Table 6. Relationship between Knowledge, Attitudes and Practice on the Foot Care.

	Practices		
	Poor (%)	Good (%)	p
Knowledge			0.818
Low	71.5	10.2	
High	14.3	4.0	
Attitude			0.146
Negative	84.2	11.2	
Positive	1.6	3.0	

*Significant at level p<0.05 N=109

Table 7.Relationship between the Level of Education and the Knowledge on D Type 2 Disease.

Level of education	Level of Knowledge		*p*
	n	%	
			0.001
Primary School	49	45.0	
Secondary School	43	39.4	
Diploma	8	7.3	
Degree	9	8.3	

*Significant at level p<0.05 N=109

monitoring the glucose level in their blood. Therefore, we conclude that the above result could have been influenced by respondents' formal educational background. As shown in the demographic data, a total of 109 respondents of this study, 92 (84.4%) had low formal educational background, and only 20 (18.3%) respondents scored high knowledge compared to 89 (81.7%) had low knowledge about diabetes mellitus and its management. Statistically, the result of this study also had shown a strong significant relationship between the level of knowledge and the level of education with n=109, p = 0.001.

From the past research findings it is also stated that, patients who had low level of educational background lead to low level of knowledge. If a person has low educational background, they will also have low knowledge of about their condition or disease and this may lead to poor attitude and practice (8). Therefore, the level of formal education is an important indicator in contributing to the understanding of the disease and self-management in any condition.

The overall result of respondents' practice towards care of the feet was also noticeably poor. It was found that, only 31(28.4%) had good practice compared to 78(71.6%) had poor practice. Although most respondents 98(89.9%) washed their feet everyday and whenever they reached home, they inspected their feet and kept them clean, but they did not use warm water to clean while checking their feet. We also found that, 70 (64.2%) of them did not wear closed- shoes, 63 (57.8%) did not wear shoes regularly at home and more than 50% did not inspect their shoes every time before using it. The practice of not wearing shoes in the house could be influenced by the culture of respondents, as in the demographic data, 102 (93.6%) respondents were Malays, 5 (4.6%) Indians and 2 (1.8%) were Chinese, as for the Malays, wearing shoes in the house is rarely practiced. Checking the feet as a routine activity, was not done not only by respondents, but also during the follow up clinic, it was found that, only 50 (45.9%) respondents had foot examination during the last visit to the clinic. This finding was similar to the previous study whereby, more than 50% of patients did not have their feet examined by their physician and foot education was not given (12).The poor practice on the care of the feet, could be due to the inconsistence of information given regarding care of the feet during the follow-up sessions. Therefore, checking of both feet would not have been done by respondents due to the poor or lack of information given.

As for the Attitude component, it was found that, only 5 (4.6%) respondents had positive attitude on care of the feet, 104 (95.4%) had poor attitude. Majority of respondents 102(93.6%) said they were able to take care of their feet, but they received 32(29.4%) little support from family and friends, in taking medication, getting enough physical activity and checking the glucose level. However, 91(83.5%) said their family and friends gave them support in term of handling their feelings of being newly diagnosed as DM type 2 patient, this could be because of the little knowledge of respondents' families and friends too had, on DM and its management.

This study has provided the prevalence of knowledge, attitude and practice of the newly diagnosed DM type 2 patients from the low educational and socio economic background. The overall results were practically poor, particularly on the consistency of information given on care of the feet, diet, exercise and administration of diabetic drugs. Proper information should be given by the appropriate health care providers before they obtained it from others. Information of self- management on diabetes should not only be given to the newly diagnosed patients, but also to the family members. Support from the family members and friends in adapting to the new routine are needed. However, patients with a higher educational background had a better knowledge on managing the disease and the feet.

Strategies should be developed by the health care providers to educate the newly diagnosed DM type 2 patients with low educational and socioeconomic background, to avoid long-term complications. The diabetic nurse educator should be responsible in educating the new cases and the family. The poor practice of foot care and self-management of DM type 2 are the responsibility of healthcare providers (12). Health care provider needs to be aware on the limitation of the low educational and socio-economic background patients in handling the new routines in life. Training the health care professionals is one of the strategies to change the poor attitude to positive attitude of diabetes mellitus patients.

Regarding for the Malay patients, cleaning and washing both feet until the ankle is one of the most important practices before their prayer, which has to be performed everyday. This ritual practice is performed five times a day or every time before prayer and it is called '*ablution*.' "*Ablution, as the centre of five senses, the eyes, ear, nose mouth, hand and feet, has been proven by the expertise of the neurologists that the chain of thought can be routed by cooling fingers of the hand and feet during the process"* (13). Therefore, it would be informative if the patients were informed to check on both feet while performing ablution. It is also important for the low educational and socio-economic background patients to have this information as it is convenient, consistent and without incurring any cost.

In conclusion, the study showed that, respondents of the newly diagnosed DM type 2 of this study, had little knowledge, poor practice and negative attitude towards the management of the condition and care of the feet. This is mainly due to the influence of their low educational background and associated with low social income. Therefore, nurses and other healthcare providers need to strategize the information as a form of promoting and educating to the newly diagnosed DM Type II patients. The practice such as, washing, cleaning, massaging, squeezing and observing of feet are the information.needed for prevention of long term complications of the feet. Regarding for the Muslim patients, the above practice could be performed during ablution. Therefore, future suggestion from this study is to look at the effect of ablution as longitudinal study on long-term practice among Muslim diabetes patients and the development of foot complications.

References

1. Edmonds ME, Alethea VMF, Lee JS. A Practical Manual of Diabetic Foot Care. 2nd Ed. 2008, London: Blackwell Publishing, Chapter VIII

2. Moodley LM, Rambiritch V. An assessment of the level of knowledge of diabetic patients, in a primary health care setting, on diabetes mellitus. S A Fam Pract 2007; 49(10):16
3. Valensi P, Girod I, Baron F, et al. Quality of life and clinical correlates in patients with diabetic foot ulcers. Diabetes Metab J 2005; 31(3 Pt 1):263–71
4. Rheeder P, Venn M, De Korte E, etal. Knowledge of foot care in people with Diabetes In a tertiary care setting. Journal of Endocrinology, Metabolism and Diabetes of South Africa 2008;13(3). Website: http://www.jemdsa.co.za/index.php/JEMDSA/article/view/48. last accessed on 22.11.2011
5. Desalu OO, Salawu FK, Jimoh AK, et al. Diabetic foot care: self reported knowledge and practice among patients attending three tertiary hospitals in Nigeria. Ghana Med J 2011; 45(2):60-5
6. Mafauzy M. Diabetes Mellitus in Malaysia. Med J Malaysia 2006; 61(4):397-8
7. Ooi GS, Rodrigo C, Cheong WK, et al. An evaluation of the value of group education in recently diagnosed diabetes mellitus. Int J Low Extrem Wounds 2007; 6(1):28–33
8. Shah VN, Kamdar PK, Shah N. Assessing the knowledge, attitudes and practice of type 2 diabetes among patients of Saurashtra region, Gujarat. Int J Diabetes Dev Ctries 2009; 29(3):118-22
9. Varughese GI. The Impact of Diabetes Mellitus on Endothelial Dysfunction. Southern Med J 2007; 100(2):128-9
10. Persell SD, Keating NL, Landrum MB, et al. Relationship of diabetes-specific knowledge to self-management activities, ambulatory preventive care, and metabolic outcomes. Prev Med 2004; 39(4):746-52
11. The University of Michigan. Diabetes Care Profile. Michigan Diabetes Research and Training Center 1998; Retrieved from http://www.med.umich.edu/mdrtc/profs/documents/svi/dcp.pdf Last accessed on 21.11.2011
12. 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(10):687-90
13. Website: http://www.islam.com/salat/wudhu.htm. last accessed on 21.11.2011