ORIGINAL ARTICLE

The Effects of Diabetic Footcare Programme Towards Quality of Life Among Type II Diabetes Mellitus Patients in UKM Medical Centre (UKMMC)

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ABSTRACT

Introduction: Diabetic footcare programme is essential for type II Diabetes Mellitus patients to improve quality of life as well as to prevent diabetic foot complication. The study was conducted to evaluate the effectiveness of diabetic footcare programme towards quality of life among type II Diabetes Mellitus patients in Universiti Kebangsaan Malaysia Medical Centre (UKMMC), a tertiary centre. **Methods:** This is a quasi-experimental one group pre-test and post-test design, done in the orthopedic ward and out-patient medical clinic for a period of 1 year . The participants received a structured footcare education titled as "Diabetes Footcare" and a pamphlet of footcare. The Nottingham Assessment of Functional Footcare (NAFF) and Diabetes Quality of Life (DQoL) Brief Clinical Inventory were used to assess the outcomes before and one month after the programme. Data was analysed with descriptive and inferential statistics using SPSS version 23. **Results:** A total of 37 participants was involved. Total score of foot care was improved between pre-test (M = 1.32, SD = .474) and post-test and (M = 1.94, SD = 0.229). There were four subscales in quality of life; satisfaction with treatment, impact of treatment, worry about future and social/vocational worry. The result showed there was a statistically significant difference between pre-test and post-test of foot care (M = 1.94, SD = 0.229, p<0.001) and quality of life (M = 61.94, SD = 5.264, p<0.001). However, foot care was not associated with quality of life. **Conclusion:** The diabetic footcare programme improves the footcare behaviour and quality of life of type II DM patients.

Keywords: Diabetic foot, Quality of life, Type II diabetes mellitus

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INTRODUCTION

Diabetes mellitus (DM) is a form of metabolic disorder due to impairment in insulin production, insulin action or both and associated with chronic hyperglycemia and impairment of carbohydrate, fat and protein metabolism (1). It represents a serious health issue in all around the world. It is estimated by the International Diabetes Federation (IDF) that the number of adults with diabetes globally will rise from 2.8% in 2000 to 4.4% in 2030. It showed that it will affect about 366 million people (2). This number increase most likely because of amendment in daily lifestyle and an intensity of life expectancy in the general population. These factors are influence in the treatment and well-being of diabetes patients, thereby affecting the course of the diseases and quality of life (1). Diabetes Mellitus is a silent epidemic and attributed to changing dietary, lifestyles and negative of rapid urbanization (3).

According to Sae-Sia et al. (4) reported that DM is also the eighth most common cause of death in Indonesia. The numbers of cases among adults (20-79 years) is predicted to increase from 7 million in 2000 and 12 million in 2030 in Indonesia.

Tan and Magarey (5) stated that Malaysia is a fast flowing in socio-economic growth and increase in nutritional habits resulting overweight and obese on the most of

population which is reflected in prevalence of diabetes in Malaysia over the last few decades from 0.65% in 1960 to 2.1% in 1982, 8.4% in 1996 and 11% in 2006. Sharoni and Wu (6) mentioned that population in Malaysia is 28.3 million in 2010 and nearly 1.2 million diabetic patients. The prevalence will increase substantially from 0.94 million in 2000 to 2.48 million by 2030. Patients who are risk of type II diabetes increased by age and patients older than 55 years old represent 50% of all type II diabetes cases. Approximately 17.5% (3.5 million) of adults 18 years and above have diabetes in Malaysia according to The National Health and Morbidity Survey (NHMS) (2015) (7).

Diabetic foot ulcers are one of the most major complications of DM. It increases the burden on the patients and healthcare system and often characterized by poor outcomes. It also contributes disability and loss of health-related quality of life (HRQoL) (8). The patients with foot ulcer have poor healing, and after 20 weeks of care almost 67% remain unhealed (9). This situation will put the patient in social isolation, negative psychological impact and experience fear for the future, higher level of depression, and dissatisfaction with personal lives (10). Therefore, it also increases the burden on patients in terms of distress, morbidity and impaired physical functioning (9).

The development of a foot ulcer among diabetes mellitus patients affects about 2-3% in each population each year and 15% will experience this complication in their lifetime (11). In approximately 85% of the patients, this foot ulceration may require lower limb amputation (9). Shabani and Torki (12) reported that more than 25% of lower limb amputations in Australia which is 80% had been caused by a foot ulcer.

Rocha et al. (8) reported that insufficient foot self-examination and foot care is a major challenge for early diagnosis of patients with diabetes at high risk of lower limb ulcers. Studies have reported that only 10%-19% of patients with diabetes had feet examined after taking off their footwear and socks. In a study by Shabani and Torki (12) showed that only 20% of patients with foot ulcer had examined their feet carefully and 23%-25% never did it. McInnes et al. (13) stated that 23-63% of diabetic patients examined their feet rarely or not at all and most of the patients' lack of knowledge on serious diabetes illness and the need of preventive measures concerning foot complications. The study revealed that patients though that foot problems arise due to poor blood supply and not nerve damage. People suffering from diabetes receive lack of adequate knowledge on foot care during the early years following their diagnosis thus felt let down by healthcare professionals.

This study is carried out to measure the effects of a diabetic footcare programme among type II DM patients at a tertiary hospital. Continuity of care in the hospital and at home is needed by diabetic patients. Adequate knowledge is needed by the patient to achieve a self-care management that is optimum. This study enhances patient's knowledge and perseverance with the changes of behaviour achieved and prevent old habits from relapsing. This a specific diabetic footcare programme to meet the needs of the patient. The findings achieved from this research can strengthen patient's knowledge while improving quality of life.

MATERIALS AND METHODS

This is a quasi-experimental design with non-equivalent group pre-test and post-test. The study was conducted in the orthopaedic ward and out-patient medical clinic of Universiti Kebangsaan Malaysia Medical Centre (UKMMC) for a period of 1 year . Convenience sampling was used to participants who meets the inclusion criteria. Patients with Type II Diabetes Mellitus are in the inclusion criteria, referred by the doctor for diabetic education, 30 years and above, independent in activities daily living and having at least one these diabetic foot classifications using King's classification from stage 1, stage 2, stage 3 and stage 4 . Patients with Gestational Diabetes Mellitus (GDM), had a bilateral limb amputation and foot gangrene were excluded in this study. Sample size was calculated by formula (14). According to this calculation, the sample size calculated is 32 for this study as intervention group. 37 participants were received a structured footcare education programme titled as "Diabetes Footcare" and a pamphlet of footcare. The patients were given teachings on one-to-one basis using slides and they are given a pamphlet for them to bring back home to read as notes to remember. The Diabetes Quality of Life (DQoL) Brief Clinical Inventory and Nottingham Assessment of Functional Footcare (NAFF) and were used to assess the outcomes before and one month after the programme. A questionnaire in booklet form which consists of Section A: Socio-demographic data (7 items); Section B: Nottingham Assessment of Functional Footcare (NAFF) (27 items) and Section C: Diabetes Quality of Life Brief Clinical Inventory (DQoL Brief Clinical Inventory) (15 items). A panel of experts assessed the face and content validity of the instrument; consist of an orthopaedic surgeon who speciality in footcare, diabetic nurse educator and patients with type II Diabetes Mellitus to ensure that the questions were relevant and appropriate in the current setting and culture of Malaysia.

The questionnaire distributed after gaining ethical approval from the ethics committee of Universiti Teknologi MARA (UiTM) and UKMMC with approval number UKM 1.5.3.5/244/FF-2015-339.

Data was analysed with descriptive and inferential statistics (factor analysis, paired t-test and Pearson correlation coefficient) with SPSS version 23.

RESULTS

The socio-demographic data is shown in Table I. Results show the total participants were male 21 (56.8%) and 16 (43.2%) female participants who participated in this study. The age of participants ranged between 31 to 78 years with mean 58.19±11.56. The minimum age was 31 years while maximum age was 78 years. The majority of the participants were 28 Malays (75.7%), while the 4 Indians were minimum participants in this study (10.8%). There were 5 Chinese (13.5%) who participated in this study. Therefore, this study had unequal race distribution because the data was randomly selected.

Thirty-three of participants in this study were married (89.2%), 2 (5.4%) of them were single and 2 (5.4%) were divorced. The result showed that 24 (64.9%) had attended secondary school education, 7 (18.9%) had primary school education and 6 (16.2%) were from tertiary education. Among the 37 of participants, most of them were retired 18 (48.6%), unemployed 6 (16.2%), in government sector and working on their own 5 (13.5%) and private sector 3 (8.1%). The result also showed that majority of the participants were living with family members 35 (94.6%) and only 2 (5.4%) were staying alone.

Table II shows the mean pre-test and post-test NAFF score from the intervention group. Paired t-test was

Table I: Socio-Demographic Data of Participants (n=37)

Categories		n (%) 37(100%)
Age	Mean (SD)	58.19 (11.56)
Gender		
Male		21(56.8%)
Female		16 (43.2%)
Race		
Malay		28(75.7%)
Chinese		5(13.5%)
Indian		4(10.8%)
Marital Status		
Single		2(5.4%)
Married		33(89.2%)
Divorced		2(5.4%)
Education		
Primary		7(18.9%)
Secondary		24(64.9%)
Tertiary		6(16.2%)
Occupation		
Own Business		5(13.5%)
Private		3(8.1%)
Government Sector		5(13.5%)
Unemployed		6(16.2%)
Retired		18(48.6%)
Living with		
Family Member		35(94.6%)
Alone		2(5.4%)

Table II: The Changes of NAFF Score Between Pre and Post Intervention

No	Questionnaire Item	Pre		Post		P value
		Mean	SD	Mean	SD	
1	Do you examine your feet?	1.32	1.355	2.51	0.692	.001*
2	Do you check your shoes before you put them on?	1.54	1.346	2.57	0.555	.001*
3	Do you check your shoes when you take them off?	0.92	1.090	2.32	0.669	.001*
4	Do you wash your feet?	2.62	0.794	2.95	0.229	.006*
5	Do you check your feet are dry after washing?	1.89	1.048	2.57	0.555	.001*
6	Do you dry between your toes?	1.32	1.156	2.51	0.607	.001*
7	Do you use moisturising cream on your feet?	1.14	1.228	2.43	1.015	.001*
8	Do you put moisturising cream between your toes?	0.95	1.224	2.43	1.015	.001*
9	Are your toenails cut?	2.57	0.647	2.86	0.585	.026
10	Do you wear sandals?	1.03	1.093	0.51	0.932	.003
11	Do you wear slippers?	0.84	1.118	1.19	0.908	.003
12	Do you wear trainers?	2.14	0.918	2.14	0.918	1.00
13	Do you wear lace-up shoes?	1.59	1.212	0.57	0.929	.001*
14	Do you wear pointed-toed shoes?	2.86	0.481	2.92	0.277	.422
15	Do you wear flip-flops?	1.89	1.286	2.11	0.906	.088
16	Do you break in new shoes gradually?	1.95	0.815	1.86	0.787	.262
17	Do you wear artificial (e.g.nylon) socks?	2.08	1.115	2.19	0.908	.254
18	Do you wear seamless socks/stockings/tights?	1.38	1.187	2.41	0.927	.001*
19	Do you wear shoes without socks/stockings/tights?	1.46	1.120	2.22	0.787	.001*
20	Do you change your socks/stockings/tights?	1.30	1.199	1.92	0.862	.001
21	Do you walk around the house in bare feet?	1.19	1.391	0.76	0.983	.003
22	Do you walk outside in bare feet?	0.49	0.989	0.11	0.315	.011
23	Do you use a hot water bottle in bed?	0.11	0.516	0.03	0.164	.373
25	Do you use corn remedies/corn plasters/paints when you get a corn?	2.51	0.961	2.54	0.900	.822
26	Do you put a dry dressing on a blister when you get one?	2.59	0.927	2.57	0.929	.744
27	Do you put a dry dressing on a grazes, cuts or burns when you get one?	2.35	1.136	2.30	1.151	.624
	Total score	**1.32**	**.474**	**1.94**	**.229**	**.001***

Note: *Significant difference between pre-test and post-test with p<0.05 using paired t-test

done to examine the effectiveness of diabetic footcare programme. There was a significant difference in the footcare behaviours level after the intervention programme (p=0.001) by looking at the results and when comparing scores between pre-test and post-test. It is indicated that diabetic footcare programme was able to change footcare behaviour of the participants. The mean pre-test NAFF score (M = 1.32, SD = 0.474) and the mean post-test score (M = 1.94, SD = 0.229). It showed that it was significantly higher after the implementation of diabetic footcare programme.

Analysis of the data shows that; intervention programme caused an increase in score of the footcare behaviour of participants. The differences were remarkable. The highest mean level of respect of washing feet (M = 2.95, SD = 0.229) was found after one month of intervention,

as compared to the first (M = 2.62, SD = 0.794). The item which attracted the second highest mean score of cutting toenails which pre-test (M = 2.57, SD = 0.647) and post-test (M = 2.86, SD = 0.585). Meanwhile, the third highest in mean score after intervention were: checking daily inside shoes (M = 2.57, SD = 0.555) and checking feet are dry after washing (M = 2.57, SD = 0.555). It is indicated that the patients are able to change the behaviour in checking of shoes and feet. The mean pre-test score for examining feet (M = 1.32, SD = 1.355) and increases after intervention (M = 2.51, SD = 0.692). Similar to behaviour of dry between toes after washing increases after intervention (M = 2.51, SD = 0.607). It indicates that pre-test and post-test showed a significant difference.

After intervention, participants replied in all items that they were doing better than the corresponding answers, before intervention. An astounding difference between distributions of answer was found in questions 7 and 8, concerning with health perception well-being: before intervention mean score 1.14 (SD = 1.228) of patients who do not apply moisturising cream on their feet, after intervention increased to mean score 2.43 (SD = 1.015). In question 8, before intervention mean score was .95 (SD = 1.224) of patients who do not apply moisturising cream between toes and after intervention, which increased to mean score 2.43 (SD = 1.015).

In Table II, the data shows a significant difference between mean score of pre-test and post-test for behaviour in wearing stocking. Most of the participants show positive behaviour in wearing stocking after intervention which mean score of pre-test in wearing seamless socks/ stockings/ tights (M = 1.38, SD = 1.187) and increased to (M = 2.41, SD = 0.927), wearing shoes without socks/ stockings/ tights (pre-test, M = 1.46, SD = 1.120) and post-test (M = 2.22, SD = 0.787) and changing socks/ stockings/tights before intervention mean score 1.30(SD = 1.199) and increased after intervention to mean score 1.92 (SD = 0.862).

The mean pre-test in not walking barefoot inside the house score (M = 1.19, SD = 1.391) of the participants was found significantly different when compared with the mean post-test (M = .76, SD = 0.983). Similar to pre-test in not walking barefoot outside the house mean score (M = 0.49, SD = 0.989) and decreased to (M = 0.11, SD = 0.315).

No significant difference was found between the mean score of wearing pointed-toed shoes of the participants, before and after intervention. The footcare behaviour in wearing pointed-toed shoes, before intervention was 2.86 (SD = 0.481), after intervention was 2.92 (SD = 0.277) which p = 0.422. There was no significant difference between pre-test and post-test in the item of wearing flip-flops. However, the item of wearing sandals (post-test score) after the implementation of the footcare

behaviour programme was significantly higher (M = .51, SD =0.932) than wearing slippers (M = 1.19, SD = 0.908).

Majority of the participants reported that they never used a bath thermometer before bathing. The result shows the mean pre-test score (M = 0.43, SD = 0.867) and almost similar with the mean post-test score (M = 0.57, SD = 0.959). Meanwhile, there was no significant difference with regards to wound management between pre-test and post-test score after intervention given. The mean pre-test score in item applied a dry dressing on blisters (M = 2.59, SD = 0.927) and mean post-test score (M = 2.57, SD = 0.929) and mean pre-test score for item if they never applied a dry dressing on grazes, cuts or burns (M = 2.35, SD = 1.136), and almost similar to mean post-test score (M = 2.30, SD = 1.151).

Factor analysis was performed using the data obtained. According to the developers of the DQOL, four original subscales model was proposed. Four distinct factors (four subscales) were yielded from a rotated Varimax component matrix. Subscale one related specifically to satisfaction with the treatment received and contained three items (1,2 and 5), subscale two specifically related to impact of the treatment (items 10,11,12 and 13), subscale three specifically related to worries about future effects of diabetes (items 4,6, 9 and 15) and subscale four specifically related to worries about issues on social/vocational (items 3,7,8 and 14). These factors of DQOL Brief Clinical Inventory are shown in Table III with their respective items and factor loading.

The four quality of life factors of diabetes accounted for 100% of the variance for the rotation sums of squared loadings. Overall, diabetes quality of life was high (mean = 15.48). The highest score was for worry about the future effects of diabetes (mean = 16.56) indicated that the participants were worried about the future with diabetes. It was followed by impact of the treatment (mean = 16.54), social/vocational worry (mean = 15.70) and satisfaction with the treatment (mean = 13.13). Internal consistency for each factor was acceptable, as measured by Cronbach's alpha, the alpha values for all factors was 0.69.

Table IV shows the median scores of the four subscales in DQoL. The four subscales are satisfaction with treatment, impact of treatment, worry about future and social/vocational worry. The results indicates that a statistically significant difference between pre-test and post-test in total score with p<0.001. In general, type II diabetic patients had significantly lower median scores post-test (M = 13.13, SD = 1.797) in satisfaction with treatment compares to other subscales, which means that these diabetic patients have substantially poorer DQoL in this factor. The highest mean level in these subscales were worry about future post-test (M = 16.56, SD = 2.544) and almost similar with subscale impact of

Table III: Principal Component Analysis of DQoL Subscales

No	Questionnaire Item	Satisfaction with treatment	Impact of treatment	Worry about future	Social/ vocational worry
1	How satisfied are you with your current diabetes treatment?	0.789			
2	How satisfied are you with the amount of time it takes to manage your diabetes?	0.864			
5	How satisfied are you with the time it takes to determine your sugar level?	0.565			
10	How often do you have pain because of the treatment for your diabetes?		0.824		
11	How satisfied are you with the burden your diabetes in placing on your family?		0.139		
12	How often do you feel physically ill?		0.877		
13	How often do you worry about whether you will pass out?		0.597		
4	How often do you worry about whether you will miss work?			0.461	
6	How satisfied are you with the time you spend exercising?			0.823	
9	How often do you feel diabetes limits your career?			0.503	
15	How satisfied are you with your knowledge about your diabetes?			0.833	
3	How often do you find that you eat something you shouldn't rather than tell someone that you have diabetes?				0.935
7	How often do you have a bad night's sleep because of diabetes?				0.823
8	How satisfied are you with your sex life?				0.918
14	How satisfied are you with time spent getting checkups for your diabetes?				0.466
	Eigen values	1.565	0.958	0.882	0.595
	% of variance explained	39.13	23.95	22.03	14.87
	Cumulative % of variance explained	39.13	63.09	85.13	100.0
	Mean	13.13	16.54	16.56	15.70
	Alpha	.715	.777	.497	.404
	Total scale: α = 0.69, Mean = 15.48				

Table IV: The Scores of DQoL Subscales Pre and Post Intervention

No	Variables/subscales	Pre		Post		P value
		Mean	SD	Mean	SD	
1	Satisfaction with treatment	3.96	.706	13.13	1.797	.001*
2	Impact of treatment	3.70	.748	16.54	2.304	.001*
3	Worry about future	3.87	.889	16.56	2.544	.001*
4	Social/vocational worry	3.72	.590	15.70	1.644	.001*
	Total score	**3.29**	**.570**	**61.94**	**5.264**	**.001***

Note: *Significant difference between pre-test and post-test with p<0.05 using paired t-test

Figure 1: Scatterplot of Footcare Behaviour and Quality of Life

treatment (M = 16.54, SD = 2.304). The mean scores of social/vocational worries also show a significant difference between pre-test (M = 3.72, SD = 0.590) and post-test (M = 15.70, SD = 1.644) after intervention.

Fig. 1 demonstrated that to measure the relationship between footcare behavior and quality of life, a bivariate correlation was used. The result of the scatter dot shows that a negative relationship exists between footcare behavior and quality of life (r = -0.135, p = 0.213). Therefore, footcare behavior scores have no association with quality of life scores.

DISCUSSION

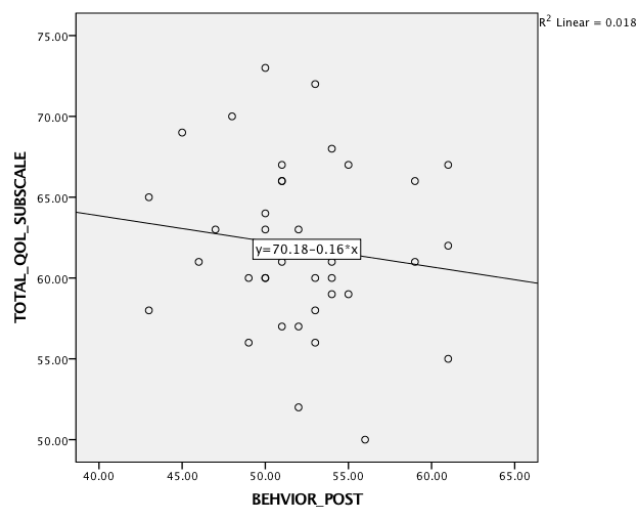Diabetic footcare programme served as a successful strategy in enabling diabetic patients to change their footcare behavior. In this study, the diabetic footcare programme played an important role in encouraging the diabetic patients to achieve ideal footcare behavior. The result of this study showed that there was a significant difference in the footcare behaviors level after intervention programme. Therefore, the result of the study rejected null hypothesis as the diabetic footcare programme showed a significant difference of footcare behavior mean score between pre-test and post-test. In addition, there was improvement of footcare behavior in

participants after intervention. Research by Kurniwawan and Petpichetchian (15) showed that the most effective strategies in reducing diabetic foot complications is in improving footcare behavior among type II diabetes patients. It has been reported in some literature that self-care of the foot can detect foot complications early (16). These study findings are consistent with previous study conducted by Sae-Sia et al. (4) where self-management (SM) support program have been effective in improving patients' in diabetic footcare behaviors. SM support program incorporated different footcare strategies which included monitoring and increasing patients' level in self-confidence and played an important role in improving their diabetic footcare behavior.

In this study, the diabetic footcare programme combined with educational strategies to support improvement in footcare behavior. During educational session, the participants were allowed to gain knowledge and particular additional information was given. In addition, the pamphlet was given to the participants before going home to guide them in performing their daily footcare. Previous study by Vatankhah et al. (17) similarly reported that education sessions combined with an explanatory booklet improved the patients' knowledge and behaviors on diabetic footcare within a period of six months.

The study found that the mean score of washing feet was higher after intervention programme. Washing feet was more achievable as compared to other diabetic footcare components. As mentioned by Kurniwawan et al. (18) in his study stated that all the participants were already familiar with basic footcare and foot hygiene since this was part of their religious practices. All the participants were Muslim and they must wash their feet at least five times a day before praying. It also corresponds with this study that most of the participants were Muslim compared to other religions. Therefore, improving foot hygiene was easier and more achievable compared to other components in footcare.

This study revealed consistent findings with the results of Rocha et al. (8) who reported that more than 50% of the participants cut their toenails very short and round. The practice of cutting toenails short and round is similar with the present study. Another study by Chin and Huang (19) stated that most of the participants cut their toenails straight across because in Taiwan, toenail management was often handled by beauticians. The result also shows that the participants used to dry between their toes after wash, checked their footwear before wearing and wore comfortable soft footwear after intervention. It is similarly reported in study of Rocha et al. (8) who mentioned that more than 50% of subjects were generally aware of the need for footcare on daily basis. It is also reported that the subjects did not use heating pads and washing the foot with soap and water and properly drying them.

In a study by Bartolo et al. (20), it was mentioned that ninety-seven of the participants reported that never using a bath thermometer before bathing in their life. The findings are similar with this study that most the participants did not use bath thermometer on daily basis. Component of wound management reported that after intervention, there was no significant difference between pre-test and post-test mean score. Most of the participants had poor knowledge regarding wound management and showed inadequate behavior on wound care. Bartolo et al. (20) reported in a study that participants behavior pertaining to wound management was reported as insufficient and could increase morbidity especially at high risk of diabetic foot complications.

In addition, the present study's results show no significant difference between pre-test and post-test on component of wearing flip-flops. In this study, the behavior recommended is still not a common practice although every participant was given information regarding proper footwear. The result was supported by Kurniwawan et. al (18) who stated that the Indonesians commonly wear flip-flops sandals as their normal footwear. The participants faced cultural challenges and need to buy suitable shoes or sandals if not allowed wear flip-flops as recommended to do. Although diabetic patients are concerned about foot health, they still seldom wear socks and shoes during summer months especially those living in tropical/subtropical regions (19). Generally, the results of the present study were supported by several studies.

Patients with diabetic complications have the ability to greatly affect quality of life. Diabetic foot problems such as infections are one of the factors that most affects quality of life. In view of this, possible risk factors leading to ulcer infection that fosters multidrug-resistant organisms (MDROs) should be assessed (21). In identifying an occurring infection, a recent study suggests that procalcitonin can be used as an infection marker although not as sensitive as hs-CRP (22). In a study of Mazlina et. al (10) reported that there is significantly lower quality of life in patients with foot problems especially involving mental and physical health. Another study by Vileikyte (11) stated that chronic foot ulcers greatly reduces quality of life and also affects the social life badly. In addition, emotional tension and patient's dependent on family were source of conflict in family members. In this study, the diabetic footcare programme played an important role in encouraging the diabetic patients to achieve better quality of life. The summary scores in the DQoL showed a statistically significant difference between pre-test and post-test intervention programme. Therefore, the study results rejected null hypothesis as the diabetic footcare programme showed the significant difference of quality of life mean score between pre-test and post-test.

The results of this study are consistent with previous

study of Al-Maskari et al. (3) which described that better quality of life is influenced by social support which is reflected in the patients' physical and psychological well-being. Social support empowers patient's attitude and enhances better quality of life and lessens several complications. These findings were similar with present study which is a significantly difference between pre-test and post-test.

This study had shown that most of the participants were satisfied with the treatment given for his/her illness. One of the notable mode of treatments include the use of hyperbaric oxygen therapy which has an advantage over conventional treatment of wound in terms of reduction in wound size (23). In the same study by Al-Maskari et al. (3), type II Diabetes Mellitus patients less than 40 years old have significantly greater self-care and quality of life in relation to other age groups.

Additionally, the findings from the present study showed most participants answer moderately dissatisfied on question 8 that asked about satisfaction in sexual life. This result has an impact on social/vocational worry of the participants. This finding was identical to the study of Rubin and Peyrot (24) reported that estimated that 50% of men with diabetes with sexual disfunction have a significant emotional attribution of anxiety and depression. Other studies have found among diabetic men and women a significant relationship between sexual problems and depression.

The result of this study demonstrated a significant increase in their DQoL after intervention. To enhance quality of life in type II Diabetes Mellitus patients, is to educate them to prevent foot complications.

This study also shown that footcare behavior among Malaysian patients is prevalent, and tend to have positive behavior towards better quality of life and life. The findings of this study also revealed a negative relationship exist between footcare behavior and quality of life. In the study of Mazlina et al. (10), it was reported that severely impaired health related quality of life (HRQoL) is associated with patients with diabetic foot problems, especially in the aspects of physical and mental health. In addition, it also stated that patients with foot problems achieved lower HRQoL scores in almost all the scales (physical, role physical, bodily pain, role emotional, social functioning and mental health) in Malaysian population. Therefore, the result of the study accepted null hypothesis that there is no significant relationship between footcare behavior and quality of life after intervention.

However, this finding needs to be cautiously interpreted because it may be due to frequent education received by the participants in hospital by nurses or by pamphlets that is given to them. In other words, this study sample was taken in a selected diabetic population situated in the urban area, which is from a specialized diabetic clinic and orthopedic ward in one centre. Therefore, they did not truly represent the general diabetes population in Malaysia.

Regarding these results, footcare behavior and quality of life does not have a strong relationship. It may be due to the low numbers of sample or sampling of only one center. The result in this study also may be related to the method that has been used regarding quality of life. As mentioned by Ali and Sehlo (9) that outcomes of intervention study related to quality of life should be completed at baseline with a 12 to 18 month follow up period in order to enhance further details on long term benefits and preventing amputation in diabetic foot ulcer patients.

Furthermore, in the present study, the participants experienced other actual problems that might/might not be directly related to the footcare behaviors and diabetes mellitus. Therefore, education given only focused on footcare and did not generalized on all aspects of diabetes mellitus. It is probably because there is no association between footcare behavior and quality of life. In the study by Baghianimoghadam and Afkhami (25) stated an increase in scores of the six dimensions (physical, role, social, mental, health perception and pain) after intervention. These findings increased after education on general diabetes mellitus was given.

In addition, since quality of life showed that there is no significant relationship with footcare behavior, further evaluation is needed to understand the phenomena including multiple setting with larger samples and using qualitative method to further measure quality of life and maximize the benefits of diabetic footcare programme for diabetes mellitus patients all over Malaysia and on a global basis.

CONCLUSION

The diabetic footcare programme was used in this study to prevent foot complications and enhance quality of life of patients. The diabetic footcare programme will be able to change behavior of patients in footcare. Bridging the gap between the patient and healthcare provider could be the direction towards effective foot self-care. It is very important to encourage patients with diabetes to undergo a basic footcare education and the presence of diabetic educator at every primary care setting would facilitate the behavioral and lifestyle interventions.

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