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THE ASSOCIATION OF FOOT CARE STRATEGIES (FCS) THROUGH ABLUTION WITH HBA1C AMONG DIABETES MELLITUS TYPE 2 PATIENT

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ABSTRACT
Diabetes Mellitus in Malaysia has become increasingly problematic along with issues of other cardiovascular conditions such as hypertension, heart disease and stroke. Therefore, the aim of this study is to determine the association of Foot care strategies (FCS) through ablution with Hba1c result among Diabetes Mellitus Type 2. The study design used is a Quasi experimental design. The intervention group received an Educational Package that focused on ablution, while the control group did not receive any form of intervention and received standard health care. A Wilcoxon test was used for the statistical analyses. There are no statistical changes in the mean difference of score in intervention and control group after implementation of Diabetic Foot Care Strategies for intervention group Pre-test (M=7.706, SD=2.598, P 1.000) and Post-test is (M=7.706, SD (2.598), P 1.000). It was found that 0% Changes from baseline to post test. In this study has found that there was no effect between the improvement of foot hygiene with Hba1c result even though respondent Hba1c result were well control and poorly control.

Keywords: ablution; diabetes mellitus; foot care; hba1c

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INTRODUCTION

Diabetes Mellitus is on the rise and become one of the burdens from four priority non communicable diseases (NCDs) targeted by world leader. According to research conducted in 2011 by the National Health and Morbidity Survey (NHMS) and the Ministry of Health (MOH) of Malaysia, the incidence of adult diabetes in Malaysia is expected to reach 21.6% by 2020. Diabetes type II patients are more likely to have foot issues as a result of sustained high blood sugar levels. Diabetes can damage the nerves over time, most frequently in the feet and legs, which results in numbness in the feet in about 50% of diabetic patients (Huysman, 2009). A very significant consequence of poorly treated diabetes mellitus that increases morbidity, morality, and care costs is diabetic foot ulcer (DFU). Long-term diabetes, poor metabolic management, foot deformities, advanced age, peripheral vacuole pathy, and inadequate diabetes education are just a few of the risk factors that might result in diabetic foot (Goweda, 2017). According to recent studies, diabetes patients have a 25% lifetime risk of having a foot ulcer (Ayala, 2017). On the other hand, diabetes mellitus is now the leading cause of amputation in Malaysia. According to a survey done at a specialist primary care

clinic in Malaysia, diabetes mellitus (DM) was a factor in almost 75% of amputations done there (Yusof, 2015).

According to research by Yokata et al. (2019) on the education of patients with chronic diseases, self-foot-care education programmes for preventing diabetic foot disease that include self-monitoring and feedback have educational effects like improvements in symptoms and behavioural changes. A combination of diabetes education, daily self-foot checks, personalised padding insoles, specially designed diabetic shoes, and regular physician follow-ups for foot inspections are the usual recommendations for preventing DFUs.

The Islamic practise of wudu (ablution) involves washing a section of the body, is a stage of cleansing and purification that each Muslim will be performed five times daily before prayer. The Arabic word "ablution" refers to the precise process of washing one's hands, lips, nostrils, cheeks, and feet with water (Reading, 2018). Ablution has gained incredible popularity among scientists worldwide. Unfortunately, many Muslims are unaware of the miraculous benefits of ablution, which are supported by science and medicine and which they apply to their bodies on a daily basis as a form of medical protection. Dr. Magomed Magomedov from the Daghestan State Medical Academy writes in an article titled "Muslim Ritual and Their Effect on the Person Health" about how ablution stimulates the biological rhythm of the body, particularly Biological Active Spots (BASes), which is similar to the concept of Chinese Reflexotherapy. Bases serve as buttons on recharge and control boards for certain organs (Tawfik, 2003). The evaluation of foot care strategies (FCS) through observation, checking, and massaging both feet during ablution has not yet been studied. Studies on these issues are essential to raising awareness, compliance with routine foot examinations, and information to prevent diabetic foot complications like ulcers and amputation. Therefore, the aim of this study is to determine the association of Foot care strategies (FCS) through ablution with Hba1c result among Diabetes Mellitus Type 2.

METHOD

Research design: The study design used in this study is a Quasi experimental design with the intervention group and the control group using convenient sampling method. Measurement data were collected before and after the intervention. The data collected was the baseline as the pre-test and post-test after 4 weeks. Population and sample research: This study was using convenient sampling method, enrolling a total of 62 respondents who met the inclusion criteria. The sample size was based on a similar previous study by Sharoni et al. (2018), which required 60 respondents for both the Intervention and Control groups. Materials and research tools: As part of the data collection, participants' demographic data, diabetes clinical data, diabetes foot care behaviour, and foot condition were assessed and measured at baseline.

The collected data was then analysed to determine the effectiveness of the training package in improving participants' foot care behaviour and foot condition, specifically in areas such as foot hygiene, neurological status, and vascular status. An educational package, adopted from the Malaysian Clinical Practice Management of Type 2 Diabetes Mellitus and the CPG Management of Diabetic Foot (MOH, 2020 & Thiruselvam et al., 2021), was used in this study.The Diabetes Foot self-care behaviour scale (DFSBS) (Chin & Huang, 2013 & Sharoni,A.K.S 2017) was adapted in this study. The scale was developed with two self-care behaviour scale. In the first part, participant will be assessed on the number of days their performed a certain behaviour of foot self-care during a 1-week period. The numbers of each foot care are measure and categorized into 5 groups (0 days for never, 1-2 days, 3-4 days, 5-6 days and 7 days for every day). The participant will be rated as a 5 point Likert’s scale

(Never/0 day per week, rarely/1-2 days per week, Always/7 days per week (Chin, 2013). A higher score indicates good self-care behaviour.

Collection / research stages: The intervention group received an Educational Package that focused on ablution, while the control group did not receive any form of intervention and received standard health care. The education module wide range of diabetic foot disease (DFD) and its complication, daily foot care activities adopted from (Thiruselvam, Che-Ahmad, et al., 2021).. They were reminded every day for 4 weeks during ablution time (Maghrib prayer) to conduct a comprehensive diabetic foot assessment. The use of wudu as a reminder is based on a study conducted by Al-Busaidi et al. (2020), which found that local culture and religious rituals can be utilized to improve healthcare behaviors of patients. However, upon completion of this study, the control group were provided with the same educational program as the intervention group. This study was conducted at Polyclinic Kingfisher, Hospital University Malaysia Sabah (HUMS), which is owned by University Malaysia Sabah (UMS) in Kota Kinabalu. Data analysis: The normality test was conducted and it was found that the data is not normally distributed therefore a Wilcoxon test was carried out to see if there was an effect on Hba1c towarding score of improving foot hygiene between both groups

RESULTS

Socio- Demographic Characteristic: The sample for this study consisted of 62 respondents. The socio-demographic characteristics of the participants are presented in Table 1. The age of the respondents ranged from 25 to 65 years old, with a mean of 2.44 and a standard deviation of 0.88. Among the participants, the majority were male (51.6%, n=32) and female (48.4%, n=30). In terms of ethnicity, the highest proportion of participants were Sabah Bumiputra (85.5%, n=53), followed by Chinese (12.9%, n=8) and Malay (1.6%, n=1).Regarding education level, the highest frequency was observed for secondary school (51.6%, n=32), followed by degree level (29%, n=18), diploma (12.9%, n=8), no formal education (4.8%, n=3), and PHD (3.2%, n=1). In terms of marital status, the majority of participants were married (95.2%, n=59), while the remaining participants were single (4.8%, n=3).Lastly, in terms of the participants' social economy, 51.6% (n=32) earned between RM 2000 and RM 4999 per month, 38.7% (n=24) earned between RM 0 and RM 1999 per month, and only 9.7% (n=6) earned more than RM 5000 per month.

Table 1.

Socio demographic of Respondents (n=62)

Note. Intervention, n =31, control, n =31. IQR = Interquartile range.

Variable	Intervention		Control		Total		Median (IQR)
	f	%	f	%	f	%	
Age							
25-34	4	12.9	1	3.20	5 (8.1)	8.1	2.00 (1)
35-44	27	87.1	9	29.0	36	58.1	
45-55			10	32.3	10	32.3	
56-65			11	35.5	11	35.5	
Gender							
Male	17	54.8	15	48.4	32	51.6	
Female	14	45.2	16	51.6	30	48.4	
Ethnicity							
Malay	1	3.2			1	1.6	
Chinese	0	0	8	25.8	8	12.9	
Others	30	96.8	23	74.2	53	85.5	
Education Level							
Secondary School	16	51.6	16	51.6	32	51.6	
Diploma			8	12.9	8	12.9	
Degree	13	41.9	5	16.1	18	29	
Never	1	3.2	2	6.5	3	4.8	
PHD	1	3.2			1	3.2	
Marital Status							
Married	31	100	28	90.3	59	95.2	
Single			3	9.7	3	4.8	
Socio Economy status							
0-1999	12	38.7	12	38.7	24	38.7	
2000-4999	16	51.6	16	51.6	32	51.6	
> 5000	3	9.7	3	9.7	6	9.7	

Pre-Test and Post Test Hba1c Test Result after Implementation of Diabetic Foot Care Strategies.

Table 2.
Pre-Test and Post Test Hba1c Test Changes

Variable	HBa1c Test			
	Pre-Test Mean (SD)	Post Test Mean (SD)	Change from baseline to week 4 (%)	P-Value
Intervention	7.706 (2.598)	7.706 (2.598)	0.000	1.000
Control Group	7.154 (1.764)	7.154 (1.764)	0.000	1.000

A Wilcoxon test was carried out to see if there was an effect on Hba1c towards score of improving foot hygiene between both groups as presented in Table 2. Study has found that there are no statistical changes in the mean difference of score in intervention and control group after implementation of Diabetic Foot Care Strategies for intervention group Pre-test (M=7.706, SD=2.598, P 1.000) and Post-test is (M=7.706, SD (2.598), P 1.000) Bringing 0% Changes from Baseline to post test. Same with Control group pre-test (M=7.154, SD =7.154, p 1.000) and post-test is (M=7.154, SD =7.154, p 1.000) also bringing 0% changes from Baseline to post test. Therefore, these findings support the alternative hypothesis that there was no significant difference between the pre-test and post-test HbA1c results between both groups, despite the improvement in their daily foot care behavior and foot hygiene scores. This study concludes that the improvement in foot hygiene scores did not have a significant effect on the HbA1c results.

DISCUSSION

In this study has found that there was no association between the improvement of foot hygiene with Hba1c result even though respondent Hba1c result were well control and poorly control. The mean score of both variables were same between the two group at pretest and post-test after implementation of diabetic foot care strategies. Although the finding of these study shows that there was no association between the improvement of foot hygiene with Hba1c result, in other study done by Oliver & Mutluoglu, 2023, the etiologic for diabetic foot causes by poor glycaemic control, calluses, foot deformities, improper foot care, ill-fitting footwear, underlying peripheral neuropathy and poor circulation, dry skin, etc. It was determined that patients had a lack of information about foot care, had practices which could lead to foot ulcers and that their glycaemic levels were above the targeted values (Sümeyra Mihrap et al., 2019). It has found that, long term diabetic with uncontrol sugar level affect variety of organ including the skin. Diabetic foot syndrome presents initially with callosities and dry skin related to diabetic neuropathy. An additional complication of diabetes and neuropathy involving the feet is erythromelalgia. Erythromelalgia presents with redness, warmth, and a burning pain involving the lower extremities, most often the feet (Van Hattem et al., 2008). In contrary with the finding of these study, long term monitoring should be done to determine the effect of blood sugar level to foot condition.

CONCLUSION

In this study, we investigated the association between diabetes foot care practices through ablution with HbA1c levels among Diabetes Milletus type 2 patients. Even though, the result has found no significance association between the of diligent foot care through ablution among diabetes mellitus patient and its potential to positively influence glycemic control of HbA1c levels, it is maybe due to the limitation faced that was the duration pre and post-test is just 4 weeks. Another limitation of this study, including its observational nature and the potential influence of unmeasured confounding variables. Future research endeavors should consider longitudinal designs and explore the effectiveness of specific foot care interventions in improving glycemic control. In conclusion, this study reinforces the critical role of diabetes foot care in achieving better HbA1c levels. Emphasizing foot care education and incorporating it into diabetes management plans can contribute to enhanced glycemic control and a reduced risk of complications, ultimately improving the quality of life for individuals living with diabetes.

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