The Study of Knowledge, Attitude and Practice Among Diabetic Patients During Ramadan at Hospital Tengku Ampuan Afzan

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ABSTRACT

Background: Diabetic patients are permitted to carry out devotion of fasting by following appropriate diet regimen, medication adjustment and recommended daily physical activity. Those who do not follow the medical guideline might increase the risk for acute complication associated with fasting. This study aims to evaluate the level of knowledge, attitude, and practice among diabetic patients on fasting during Ramadan at Hospital Tengku Ampuan Afzan (HTAA). **Methods**: A cross-sectional study was conducted, where 62 diabetic patients were involved in this study. Convenience sampling was applied, and the study was conducted at HTAA including medical ward, orthopedic ward, surgical ward, eye ward and diabetic clinic. The data were analysis by using one-way ANOVA. **Results**: There were significant association between level of education factor with the attitude and practice of the diabetic patients during Ramadan with the *p*-value is lower than 0.05. The mean of the one-way ANOVA for attitude and practice were increased from the lowest to the highest of education level. Meanwhile, for the other sociodemographic variables (such as age, gender and receive health education), there is no significant association ($p>0.05$) with the level of knowledge, attitude and practice among the diabetic patients. **Conclusions:** The level of education showing the significant association with the attitude and practice which it implies that those have higher education background possessed better attitude and practice management of diabetic fasting during Ramadan.

Keywords: Knowledge, Attitude, Practice, Association, Fasting, Hyperglycemia.

INTRODUCTION

Diabetes is a chronic disease that is rapidly increasing throughout the world which it becomes one of the global issues. The WHO (2020) had reported that prevalence of diabetes has been rising more rapidly in low- and middle-income countries than in high-income countries.1 It has been reported that by 2030 it was estimated that around 400 million people worldwide affected with diabetes.2 Basically, there are 4 major classes of diabetes, which are Diabetes type 1, type 2, gestational diabetes and other specific type such as due to genetic defect in insulin action, endocrine disorder and disease of the exocrine pancreas.[3] In Islam, it is an obligation to fast during Ramadan. Nevertheless, for certain groups which include those who are sick, frail subjects, and pregnant women, are exempted.[4] Fasting requires Muslim to abstain from eating, drinking, smoking, having sexual intercourse or taking oral medication from the dawn to sunset.[5] In spite of the fact that the diabetic patients are allowed to skip the fast but many of them insisted to fast. A study had revealed that without medical guidance the diabetic Muslims are at high risk on developing acute complications associated with fasting such as hypoglycemia, hyperglycemia, diabetic ketoacidosis, dehydration and thrombosis.[6-7]

There are several guidelines need to be followed by the diabetic patients that are really intended to fast. In which, the diabetic patients need to check their glucose level, before predawn meal, three hours after predawn meal, before breaking the fast and three hours after breaking the fast. In addition, fasting diabetic patients are encouraged

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to delay the predawn meals intake and break the fast as soon as possible as time comes. As patients taking meals, they are advised to avoid high glucose, fried food for example sweet drink, and using low calories of food. Besides that, fasting diabetic patients realize that they experienced sign and symptoms of hypoglycemia; in that case they are advised to break the fast to avoid further complication.[6,8]

The complication is very dangerous if not taken care properly. In the interest to avoid the complication might occur among the diabetic patients, the education or explanation on the medical guidance for fasting during Ramadan need to be disseminated among the patients. Prior to that, the understanding among the patients has to be evaluated. Herein, this study is very significance to evaluate the level of knowledge, attitude and practice among diabetic patients during Ramadan at Hospital Tengku Ampuan Afzan (HTAA).

METHODS

Study design

A descriptive cross-sectional design was applied in this study. The study was conducted at HTAA, Kuantan Pahang specifically at medical ward, orthopedic ward, surgical ward, eye ward and diabetic clinic. The participants were selected based on convenience sampling.

Study setting

This study has been conducted at Hospital Tengku Ampuan Afzan, Kuantan, Pahang, Malaysia which includes medical ward, orthopedic ward, surgical ward, eye ward and diabetic clinics. The duration of the sampling the study was conducted within a month.

Sample calculation

The sample size has been calculated based on the formula that was introduced by Taro Yamane.9 The details of the sample calculation are as follows:

$$n = N/(1+N(e)2)$$
$$n = (74) / (1+74(0.05)2)$$
$$n = 62$$

n = sample size
N = estimated population size
e = desired precision level, 0.05

The estimated population size, N is 74 with the desired precision level, e is 0.05. Hence, the sample size for this study is 62.

Variables

The dependent variable for this study is knowledge, attitude and practice among diabetic patients regarding fasting during Ramadan. Meanwhile, the independent variable is sociodemographic factors which including age, acquired health education, level of education and gender.

Ethical approval

The ethical approval was obtained from the research ethics committee from Kulliyyah of Nursing, International Islamic University Malaysia, and approval from the HTAA. There are several ethical principles the applied in this study which is the data collection will be conducted after the ethical approval was obtained. Then, the participants were informed about the overview of the study, especially its objectives. Throughout this study the participants were benefitted in terms of gaining information about the diabetes in depth and could be the contributors to the body of knowledge. As the participants were willingly to participate, an informed consent was signed to indicate an agreement of joining this study without any coercion. Meanwhile, at anytime the participants solely have their right to withdraw from the study. All the personal information of the participants was treated as private and confidential matters.

Data collection

Self-administered close ended questionnaire was used in this study. The questionnaires were adapted from previous study.[10] Ten diabetic patients were selected to participate for the pilot study of the questionnaires. Any modification of the questionnaires had been done before the questionnaires were distributed to the subjects. Participants were invited to participate if they agreed to join this study without any coercion.

The set of questionnaires was made up of the socio-demographic data, knowledge, attitude, and practice of diabetic patients on fasting during Ramadan. This questionnaire was divided into four parts which were:

A. Socio-demographic data including age, acquired health education, level of education and gender.
B. Knowledge of diabetic patients on fasting during Ramadan.
C. Attitude of diabetic patients on fasting during Ramadan.

D. Practice of Diabetes management among diabetic patients on fasting during Ramadan.

Inclusion and exclusion criteria

The respondents that were eligible to be participated in this study must be Muslim that have been diagnosed with Diabetes mellitus. The respondents also need to understand either Malay or English language. Meanwhile, the kids and teenagers that age below 18 years old are not eligible to be part of this study.

Data analysis

The data were analyzed by using statistical software which is Statistical Package for Society Science (SPSS). The descriptive statistics were tabulated in tables. Meanwhile, one-way ANOVA was conducted to detect the association between the sociodemographic data (age, acquired health education, level of education and gender) with the knowledge, attitude and practice among diabetic patient during Ramadan.

RESULTS

Table 1 portrays the sociodemographic data of the diabetic patients that had participated in this study. The total number of the participants that had completed the questionnaire is 62 participants. Majority of the participants (41.9%) are within 50 and 59 years old. Then, the number of females is greater that the number of males with the percentage are 64.5% and 35.5% respectively. Meanwhile, majority of the participants had completed their study until primary school level with percentage is 45.2%. Furthermore, 75.8% of the participants claimed that they had acquired the health education concerning diabetic management during Ramadan.

Based on Table 2, majority of the participants realized that uncontrolled diabetes would cause diabetic complications including blindness (93.5%), heart attack (80.6%) and kidney failure (93.5%). In addition, the participants are aware about the possible sign and symptoms for hyperglycemia. Majority of them understood that polydipsia (excessive thirst), slow wound healing and nocturia (woke up at night to urinate) with the percentages are 82.3%, 67.7% and 83.9% respectively. Meanwhile, they also recognized the hypoglycemic sign and symptom which involving excessive sweating and cold (74.2%), feel sleepy (64.5%) and palpitation of the heart (62.9%). Furthermore, the 66.1% of the participants knew that eating heavy diet during the pre-dawn meal is a good practice. However, the sweet food must be avoided which is 90.3% of the participants have the knowledge. Moreover, 88.7% of the participants perceived that they could perform the daily activity as usual. The participants (93.5%) were aware that they would not possibly get infection during fasting. They also understood that the diabetes could be controlled during fasting. However, only 37.1% of the respondents were aware that dehydration might occur during fasting. Table 3 depicts the association between sociodemographic data with the knowledge of diabetic patients on fasting during Ramadan. All factors showed no significant association with the knowledge of the participants (p-value is greater than 0.05).

Figure 1 illustrates the percentage of attitude among diabetic patients during fasting. It was noted that 91.9% of the participants aware that they need to measure their blood glucose level during fasting. Besides that, 79% of the participants showed that they can manage and control their diabetes through diet and medication. In addition, about 80.6% of respondents disagree on they are unable to carry out devotion of fasting as they need to take diabetic medication. Furthermore, majority of the participants (69%) can fast for the whole month in previous Ramadan. Table 4 denotes that only level of education factor has significant association with the attitude among the diabetic patients during Ramadan with the p-value is lower than 0.05. Meanwhile, the other factors showed no significant association with the attitude of the diabetic patients.

Table 5 represents the percentage of the diabetic patients on the practice during fasting in Ramadan. Majority of the participants (54.8%) never reduce the frequency of medication during Ramadan. Then, 87.1% of the participants always ensure that they consumed the pre-dawn meal. At the period of fasting break, majority of the participants (59.7%) took the sweet food. Before going to bed, majority of the participants (53.2%) would never have meals. Table 6 shows the association between practice and the sociodemographic data. There is a significant association between the practice among the diabetic patients with the level of education as the p-value is lower than 0.05.

Diabetic patients should avoid food that containing too high carbohydrate and high sugar ingredients. There was a study suggested that during Ramadan, diabetic patients should take foods that containing complex carbohydrates.[8,12] Complex carbohydrates can be found in food that contains grains and seeds for examples barley,

Table 1. Sociodemographic data

Factors	Frequency, n (N=62)	Percentage, %
Age		
30-39	5	8.1
40-49	7	11.3
50-59	26	41.9
60-69	20	32.3
70-79	4	6.5
Gender		
Male	22	35.5
Female	40	64.5
Level of Education		
No formal education	9	14.5
Primary School	28	45.2
Secondary School	16	25.8
Tertiary School	9	14.5
Acquired health education		
Yes	47	75.8
No	15	24.2

Table 2. The percentage of knowledge among the participants for each question regarding knowledge of diabetic and fasting

Knowledge	Frequency, n (N=62)	Percentage,%
1) Diabetic complication:		
a) Can cause blindness	58	93.5
b) Heart attack	50	80.6
c) Kidney failure	58	93.5
2) Signs and symptoms of hyperglycemia:		
Polydipsia	51	82.3
Slow healing of wound or scald	42	67.7
Nocturia	52	83.9
3) Signs and symptoms of hypoglycemia:		
Excessive sweating and cold	46	74.2
Feel sleepy	40	64.5
Palpitation	39	62.9
4) Knowledge regarding correct practice:		
a)Eat heavy diet during predawn meal	41	66.1
b) Must avoid sweet food during predawn meal	56	90.3
c) Could perform activity daily living as usual	55	88.7
5) Potential problem during fasting:		
a) Difficult to get infection	58	93.5
b) Diabetic become controlled	49	79.0
c) Dehydration	23	37.1

Table 3. The association between knowledge among diabetic patients with socio demographic data

Socio-demographic factors	n	Mean (SD)	F (df)	*p*-value
1) Age				
30-39	5	10.80(1.789)	1.576(4;61)	0.193
40-49	7	10.29(1.380)		
50-59	26	10.08(2.115)		
60-69	20	9.75(2.149)		
70-79	4	7.75(0.500)		
2) Gender				
Male	22	10.55(2.110)	3.586(1;61)	0.063
Female	40	9.55(1.907)		
3) Level of Education				
No formal education	9	8.89(1.764)	1.134(3;61)	0.343
Primary School	28	10.29(2.141)		
Secondary School	16	9.75(1.880)		
Tertiary School	9	10.00(2.062)		
4)Acquired health education				
Yes	47	9.80(2.336)	0.051(1;61)	0.823
No	15	9.94(1.938)		

Figure 1. Percentage of total score for level of attitude among participants during fasting

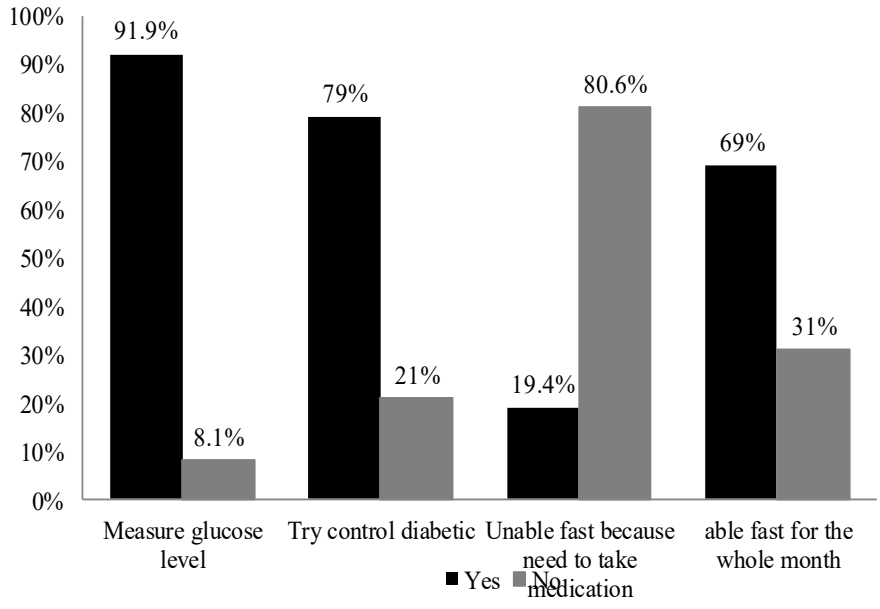

Table 4. The association between attitudes among participants with sociodemographic data

Outcome	n (N=62)	Mean (SD)	F statistic (df)	p-value
1) Age				
30-39	5	2.80(1.304)	0.653(4;61)	0.623
40-49	7	3.00(1.155)		
50-59	26	3.15(0.967)		
60-69	20	3.40(0.754)		
70-79	4	3.50(0.577)		
2) Gender				
Male	22	3.05(1.214)	1.074(1;61)	0.304
Female	40	3.30(0.723)		
3) Level of Education				
No formal education	9	2.56(1.094)	4.346(3;61)	0.008*
Primary School	28	3.22(0.972)		
Secondary School	16	3.46(0.693)		
Tertiary School	9	3.56(0.726)		
4) Acquired health education				
Yes	47	3.19(0.900)	0.074(1;61)	0.787
No	15	3.27(1.033)		

*P-value less than 0.05

Table 5. The percentage of practice score among participants

Question	Never	Sometimes	Always
1) Reduce frequency of taking medicine during Ramadan	54.8%	22.6%	22.6%
2)Make sure take the pre-dawn meal	4.8%	8.1%	87.1%
3) Take sweet food during fasting break	16.1%	24.2%	59.7%
4) Having other meals before sleeping	53.2%	14.5%	32.3%

Table 6. The association practice among participants with sociodemographic data

Outcome	n (N=62)	Mean (SD)	F statistic (df)	p-value
1) Age				
30-39	5	7.00(1.414)	2.322(2;61)	0.068
40-49	7	4.57(1.134)		
50-59	26	5.23(1.478)		
60-69	20	5.35(1.531)		
70-79	4	5.75(0.500)		
2) Gender				
Male	22	5.09(1.477)	1.218(1;61)	0.274
Female	40	5.52(1.485)		
3) Level of Education				
No formal education	9	4.44(1.590)	2.778(3;61)	0.049*
Primary School	28	5.06(1.843)		
Secondary School	16	5.57(0.959)		
Tertiary School	9	6.22(1.641)		
4) Received health education				
Yes	47	5.53(1.248)	2.333(1;61)	0.132
No	15	4.87(2.031)		

*P-value less than 0.05

Discussion

Based on the findings from this study, majority of the participants had acquired the health education regarding diabetic management throughout fasting either in clinic or during their hospitalization. Basically, health education concerning diabetes management is very important to avoid any acute complication due to diabetes. It is a necessity for the diabetic patients to follow the medical guidance as prescribed by the physician or authorized dietician. It has been reported that most diabetic patients do not consult their physicians prior to fasting for the adjustment of medications and lifestyle.[11] It could increase the risk of adverse glycemic events and the subsequent complication. During the educational consultation, the physician possibly should emphasize on self-diabetic management, signs and symptoms of hypoglycemia and hyperglycemia, dietary and medication regime during fasting, measuring blood glucose level, acute complications that may occur if fasting and how to manage the complications.[8,12] This is because, one study had revealed that diabetic patients who attended a specialized clinic lacked information on diabetes, in general, as well as on the practices associated with safe fasting during Ramadan.[13] Therefore, several strategies have to be planned and implemented for the education enhancement.

Majority of the participants were aware that the possible complications might occur due to diabetes. One of the complications that possibly occur if the diabetes is not in appropriate management is diabetic retinopathy. The diabetic retinopathy is a microvascular complication of diabetes which if it is not being treated could contribute to visual impairment and blindness.14 In addition, the poor blood circulation due to high glucose might cause heart attack and kidney failure.[15] Among the participants, most of them were aware about the sign and symptoms of hyperglycemia. In contrast with previous study, a lot of people do not consider the sign and symptom of hyperglycemia as a serious problem because unlike other diseases the consequences of hyperglycemia are not manifested immediately.[16] Apart from that, the signs and symptoms for the hypoglycemia are compulsory for the diabetics to know. It has been reported that the knowledge on the target fasting and postprandial blood glucose levels among the diabetic patients was low.[17]

wheat, oats, and beans.[18] The complex carbohydrate is a slow digesting food in comparison with the refined food. In fact, slow digesting food can last for up to 8 hours compared to refined food which can last only 3 to 4 hours and may result in acute hyperglycemia.[19,20] The participants were aware that they can perform routine activity as usual even though they are fasting. Physical activity can be carried out as usual but excessive activity which may contribute to risk of hypoglycemia should be avoided, especially within few hours before breaking the fast.[8,12] The infection could be caused when the immune system was weakened due to hyperglycemia. It has been reported that the hyperglycemia that was associated with obesity would cause breakdown in the integrity of the intestinal barrier and increased risk of systemic infection.[21] During fasting, dehydration might occur as the consumption of fluid is not permissible. If the losing of water in hot weather country, it would cause severe dehydration which might be resulting perspiration.[8,12] In order to replenish fluids loss during fasting day, diabetic patients are encouraged to drink adequate fluids, about 8 glasses per day and advice to choose sugar free drinks.[22]

During Ramadan it is a necessity for diabetic patients to measure their blood glucose level regularly at home that would help in providing adjustment of insulin dose and drug and to prevent acute complication of diabetic.[19] In this study, almost all the participants have positive attitude on the importance of monitoring glucose level during fasting. One study recommended that patients with diabetic who were fasting should monitor their blood glucose level about three times per day: before predawn meal, 3 hours after predawn meals and before breaking fast during sunset.[8,12] For patients with diabetes mellitus type 2, they have low risk associated with fasting complication and they can maintain their diabetic through well controlled in diet.[8,12] Overall, participants who had higher education background demonstrate positive attitude compared to participants who had no formal education background. It has been reported that the education level (university or higher) was the predictor for positive attitudes.[23]

The reducing medication would increase the risk for hypoglycemia as the food intake has been stop while fasting. It has been reported that the most rapid risk with fasting is the potential for hypoglycemia in patients who are on antidiabetic medications that are associated with hypoglycemia.[24] Therefore, the diabetic patients who are intended to fast need to consult the physician for medication adjustment. The medications that are associated with hypoglycemia should be adjusted in terms of their doses on days of fasting.[24] Nonetheless, during Ramadan the diabetic patients should not reduce the frequency of medication intake regardless of what type of diabetes is unless they have been advised by the physician.[10]

It was suggested that the diabetes type 1 patients with 3 dose insulin regimens, each dose of insulin should be administered before predawn meals and during the time for breaking fast while another one dose need be taken at late evening.[8,25] For diabetes mellitus type 1 patients with 2 dose insulin regimen who are using a combination of short acting insulin or analogue insulin with intermediate acting insulin, they were recommended that to take it before predawn and evening meals. Besides that, for patients who used continuous subcutaneous insulin infusion, they were advised to reduce the basal infusion rate and at the same time they should increase the bolus dose to cover the morning and evening meals.[26] On the other hand, for patients with diabetes mellitus type 2, medication dose adjustment, the risk of hypoglycemia can be reduced. It was suggested that patients who are on oral diabetic medication to use short acting oral hypoglycemia drug rather than long-acting drug which have high risk of hypoglycemia.[19] It is very essential for diabetic patients to consume predawn meal and supper meals to avoid potential symptoms of hypoglycemia during fasting. Majority of the participants realized that the importance of taking predawn meals followed by taking morning dose medication.

In this study, there is no association between the sociodemographic data among the diabetic patients with the level of knowledge. However, the level of education was associated with the level of attitude and practice. The significance value is lesser that 0.05 which was considered significant. It indicates that the level of education might influencing the attitude and practice among the diabetic patients. There is one study also had reported that the level of education is one of the factors that influence the level of attitude and practice.[27] Therefore, an effective health education would improve the level of knowledge, attitude, and practice.[28] Lifestyle modifications and dietary management could slow down the progression of diabetes and might help in preventing the complications.[29]

CONCLUSION

In conclusion, all sociodemographic factors (age, gender, level of education and acquired health education) show no significant association with the level of knowledge among the diabetic patients. However, only level of education factor has been significantly associated with the attitude and practice of the diabetic patients in Hospital Tengku Ampuan Afzan. Meanwhile, the other sociodemographic factors (age, gender, and acquired health education) do not show any significant association with the attitude and practice among the patients.

Acknowledgement

We would like to thank the institutions involved in data sampling for the administrative support for this research.

Funding

Not applicable

Disclosure

The authors report there is no conflict of interest in this project.

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