Effectiveness of Contextual Education for Self-Management in Thai Muslims with Type 2 Diabetes Mellitus During Ramadan

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Background: *Fasting in Ramadan has adverse effects on health of Muslims with diabetes. Key strategies to prepare the patients are to provide appropriate health education to the patients prior to Ramadan and to adjust anti-diabetic medicines during Ramadan.*
Objective: *To study outcomes of the specific health care services that providing health education in parallel with counseling by Islamic leader.*
Material and Method: *The Thai Muslims with type 2 diabetes mellitus were divided into two groups. There were 62 patients in experimental group that was provided with specific health care service for Thai Muslims with diabetes in which health education prior to Ramadan and adjustment of anti-diabetic medicine applied. The other was control group with 28 patients that was provided only with original health care service. The results were monitored after Ramadan by interviews, weight and waist measurements, blood pressure measurement and blood tests.*
Results: *Both mean systolic and diastolic blood pressure were well controlled in both groups and slightly decreased after Ramadan. The mean diastolic blood pressure of the experimental group decreased after Ramadan (p-value = 0.041). From behavior point of view, it was found that the patients in the experimental group had consumed less sweetened food (p-value = 0.002). There was no incidence of severe hypoglycemia in either experimental or control group. The number and portion of patients with hypoglycemic symptoms in experimental group were lower than those in controlled group (p-value = 0.013).*
Conclusion: *Specific health care service by providing health education prior to Ramadan and adjustment of anti-diabetic medicine application resulted in a positive effect as the patients tended to consume less sweetened food to keep blood sugar level in control. Fasting could affect the patients' health in a positive way as it helps to control blood pressure, while in parallel, adjustment of anti-diabetic medicine application helps to prevent hypoglycemia. This health care service, which can be achieved in collaboration with a health care team and Islamic leaders, is useful and suitable for Thai Muslims with diabetes mellitus type 2.*

Keywords: *Thai Muslims, Ramadan, Diabetes mellitus type 2, Primary care units, Community medicine*

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Diabetes mellitus is one of major concern for Global Muslims illness. Prevalence of diabetes in Muslims in the Middle East countries is high and still increasing[1]. During Ramadan, 40 to 50 million Muslims with diabetes mellitus around the globe fast for a period of approximately 30 days with the practice of prohibition in having food or drink during daytime. Allowed food courses are split into two; one before dawn called Suhur and the other right after dark called Iftar[2]. During the fasting, proper health care and practice should be followed otherwise the fasting may have downward effect to health. Most Muslims with diabetes mellitus decide and insist on fasting despite the risks or medical contraindications[3]. During the fasting period in the month of Ramadan, patients with diabetes mellitus type 2 had well controlled blood pressure; however, the biochemical parameters such as hemoglobin A1c, total cholesterol and triglycerides had no significant

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change[4]. On the contrary, the number of severe hypoglycemic episodes for either patients with type 1 or type 2 diabetes mellitus during Ramadan is significantly higher than those during the rest of the year are. Furthermore, it is found that the number of severe hyperglycemic episodes is materially higher than that during other periods[5].

Health issues for Muslims relate to religious, culture and scientific perspectives-in addition, it also depends heavily on how strict the individual is in religious belief. Based on this assumption, it is important to provide and apply proper a treatment program accordingly and specifically for these individuals[6]. In Iran, Ramadan 3D triangle[7] was implemented by focusing on 3 key sections; namely, "Drug regimens" adjust the dose of anti-diabetes medicine to prevent complications "Diet control" (provide advice on the proper diet) and "Daily activity" (to provide guidance on exercise and daily activities). Health education prior to Ramadan should be suitably adopted by taking contexts of religious belief, social and culture into account, rather than following medical science alone as the patients tend to be more interested and participate more when it comes to religious contents[8]. Islamic leaders in the community have an important role to play in assisting health care teams educate and correct any misconceptions in religious practices and cultures thus giving advantages in taking care of diabetes-related issues[9]. It is important for health care personnel to understand and manage their actions accordingly in different contexts for Muslims[10]. The guidelines for Muslim with diabetes during Ramadan vary in use in different areas[11-13]. In Pattani, patients with anti-diabetic medicine adjustment had better control of blood sugar levels. The number of patients who had appropriate blood sugar levels dramatically increased and there no cases of complications reported[14]. Female Muslims in Bangkok suffered from insufficient self-care. Health education for patients and their family members should help the patients to manage their activities against diabetes concern. Health care service providers should be able to promote the patients' self-awareness to change their behavior by taking their cultural and religious beliefs into account as a part of educational strategies[15].

The present study presented a service model of primary health care unit to provide health education, in which principles of Diabetes Self-Management Education (DSME) and Medical Nutrition Therapy (MNT) were provided in parallel with religious principles of Islam, in co-operation with health personnel in a primary care unit and religious leaders. Other activities included adjustment of anti-diabetic medicines for patients who decided to fast during Ramadan and following up after Ramadan. All of these actions focused on holistic strategy, being in line with the patients' lifestyles, cultures and religious beliefs, which resulted in abilities of the patients to take care of themselves properly, thus preventing severe complications in Ramadan. The model might be applied to other Muslim communities in Thailand.

Material and Method

A Quasi Experimental study was done on two groups. The sample size was calculated on confidence level of 95%, power 90% and effect size of 0.73. Ratio of the experimental group and control group was 2:1, which gave the sample ratio of 62:31. Samples were selected under the following criteria; age: 35-65 years old, being diagnosed with diabetes type 2, no complications from diabetes such as kidney and heart diseases, capable of reading and writing in Thai, live in areas of the study and willing to participate in the present study. To prevent contamination due to intervention, the groups were separated based on locations of the primary care units to experimental group and control group. However, few patients in the control group decided not to fast, it caused the number of subjects in the group to be reduced to 28. The control group was provided with normal health education while the experimental group was provided with both health education and lessons from Islamic leaders. The month of Ramadan in 2012 was lasted from 20th July to 19th August 2012. The health education prior to Ramadan and adjustment of anti-diabetic medicine were applied on 9th and 12nd July 2012 (before Ramadan). Measuring for anthropometric data, blood sample collection and interview were done and compared at 10 days before the health education and 2 weeks after Ramadan (interval of 8 weeks).

The experimental group was restructured by adding health education prior to Ramadan-a lecture conducted by a physician and Islamic leader (called Imam). The Imam who was an expert in academics and Halal food was chosen from the Islamic Committee of Phra Nakhon Si Ayutthaya. The physician and the Islamic leader together prepared contents before the lectures. Once the lecture was finished, question & answer sessions followed regarding fasting, led by Imam. The question raised included "Is finger blood test allowed during fasting?", "Is Swallowing saliva allowed?", for instance. Other activities held were group

activities about proper food choices during fasting, risk assessment and adjustment of the anti-diabetic medicine for patients who decided to fast. Physicians and pharmaceutical assistants then prepared the anti-diabetic medicines and insulin for Ramadan period individually. The Thai Muslim Medical Association[12] based such adjustment of the medicine and insulin on practice guidelines for the treatment of diabetic patients during the month of Ramadan. The long acting anti-diabetic medicine such as Glibenclamide was avoided. Alternatively, due to its shorter acting, Glipizide was used. During fasting, anti-diabetic medicine dosages were reversed; the morning dose was reduced and taken with the sunset meal to prevent hypoglycemic symptoms, while the evening dose was taken with the predawn meal. Likewise, Insulin dosages were also reversed and the morning dose reduced by 50%.

The education session was conducted according to contexts of Thai Muslims who pray five times a day. One praying during daytime and another one in the afternoon were considered; however, the space in the venue in each primary care unit was not enough for such praying so the patients had to do their praying at home and would then not come back for the rest of the activities. Considering this, the activities were set only from 9:00 to 12:00 AM, total 3 hours long. Contents of the health education provided to the patients were in the form of lectures and leaflets and consisted of the following: severe complications during fasting, medical advice for safe fasting, risk assessment during fasting, healthy self-preparation before Ramadan, nutrition and diet during Ramadan adjustment of anti-diabetic medicine during Ramadan and principles of Islam about eating and drinking for health as shown in Table 1.

Statistical analysis

Mean and standard deviation were utilized to describe statistical properties of blood chemistry, whereas frequency and percentage were utilized for other qualitative variables. The different comparisons between the two groups were achieved by independent t-test and Chi-square test or Fisher's exact test, while the pair t-test method was used to assess the change between before and after the intervention.

Results

Characteristics and clinical features of the Muslims with diabetes type 2 in both experimental and control groups were classified and compared by using an independent t-test methodology. Both groups exhibited statistical similarity in age, sex, weight, BMI, waist-circumference, diabetes knowledge score, and blood chemistry analysis. The results are shown in Table 2.

However, some patients preferred to carry out their fasting for another 6 days after Ramadan was over. This 6-day period is called Buad-Hok. As a result, the experiment assessment concluded 2 weeks after Ramadan to cover the extra 6 days. It was found that the mean weight and BMI of both experimental and control groups decreased slightly. Waist circumference decreased slightly in females. It can be safely concluded that, weight, BMI and waist circumference, all had no significant differences in pre Ramadan and after Ramadan as well as between the two groups.

After Ramadan, the experimental group was more likely to control blood pressure better than the control group. The mean diastolic blood pressure of the experimental group decreased (p-value = 0.041).

After Ramadan, due to the dosage decrement of anti-diabetic medicine to prevent hypoglycemia, the experimental group had increased mean plasma glucose levels (p-value = 0.037).

In 2012, the study year, the duration of fast was slightly lower compared to 2011. In the experimental group, the average number of days in the fasting period at which they succeeded was 19.18 days, while the control group was 17.75 days. The result is as shown in Table 3.

After Ramadan, it was found that 53.2% of the patients in the experimental group lost weight, 50% in the control group. However, there was no significant change in waist-circumference, blood pressure and plasma glucose among the two groups. Nonetheless, the patients in experimental group ate less sweetened food than the control group (p-value = 0.002).

In 2012, the year of study, patients in both groups who succeeded in fasting for more than 15 days was 61.29% in the experimental group and 60.71% in the control group. Moreover, there was no incident of severe hypoglycemia during the study in either group. However, both number and percentage of the patients in the experimental group, those receiving dose-adjusted anti-diabetic medicine, were less likely to experience mild hypoglycemia than those in the control group (p-value = 0.013) did. The result is as shown in Table 4.

Discussion

A remodeling of specific primary health care service to prepare Muslim patients with diabetes

Table 1. Medical knowledge prepared by medical personnel in accordance with Islam principles-preparation for the month of Ramadan

Medical knowledge	Religious principles
-Diabetes is a chronic disease. Proper self-management is required to prevent acute and long-term complications.	-Allah created mankind who are supposed to live in a virtue practice to make life longer.
-Patients with diabetes should get risk assessment and be educated, advised by medical personnel. The individual should be able to make decision on fasting on their own.	-The Prophet Muhammad said "fast for health'. Muslims believe that fasting will lead to better health and is an obligation. However, exemption is allowed for those who are sick.
-To control diabetes, eating behavior must be controlled.	-Ramadan is the period to practice one's patience.
-Proper diet is required for patients either in terms of quantity and nutrition. Avoid sweetened and oily foods.	-The Prophet Muhammad said "eat just enough to live" which means stomach to be filled with food, water and air.
-To break fasting, fruits that contain carbohydrates (sugar) 1serving such as 3 dried dates, a small apple, a half ripen mango, a half banana, etc. may be selected. Avoid sweetened and oily foods.	-The Prophet Muhammad broke fasting with fresh dates and a sip of water. Avoid dried dates or sugar coated dates. Breaking fast with other seasonal fruits is also a good choice.
-Proper diet is required for patients either in terms of quantity and nutrition. Avoid sweetened and oily foods.	-Avoid eating too much in fast-breaking meal. Healthy eating behavior makes a merit.
-Patients with diabetes should get risk assessment and be educated, advised by medical personnel. The individual should be able to make decision on fasting on their own. High-risk patients should avoid fasting or do the fasting with care.	-Fasting can be exempted for the sick. Those who skip the fasting always have an option to donate food for the poor.
-The patients with diabetes should have 2 meals daily and adjust anti-diabetic medicines accordingly in Ramadan. Skipping Suhur (morning meal) can result in increased risk of hypoglycemia.	-The Prophet Muhammad prioritized Suhur, stating that the meal is of blessing. Avoid skipping Suhur.
-Medicine dose has to be adjusted due to changes in diet. Midday dose will be skipped.	-Fasting is to refrain from diet that makes self too energetic.
	-No need to spit all the time. Spitting makes mouth dry and does not lead to better health.-Body and mouth wash can be done as usual.
-Dose of anti-diabetic medicine will be adjusted. Midday dose will be skipped. Morning and evening doses will be shifted while morning dose will be reduced to allow longer fasting and to reduce risk of hypoglycemia.	-Oral-intake medicine is not allowed during fasting.
	-People with illness, such as diarrhea, migraine, should not do fasting from the first place.
-In case of abnormality such as fatigue, palpitations, fainting or loss of consciousness, the patients should have blood sugar level check urgently.	-In case of abnormality in patients with diabetes, pricking the blood on the fingertips to check abnormality in blood sugar level is not considered a sin or breaking the fasting.
-In case of emergency such as severe hypoglycemia or severe hyperglycemia, patients must see the physician and get proper treatment immediately.	-In case of emergency such as severe hypoglycemia or severe hyperglycemia, where injection of glucose or insulin is required, fasting on the day will be exempted due to illness and not considered a sin.

mellitus type 2 should be performed at a primary care unit before Ramadan. The patients should be educated in terms of food consumption, personal daily activity and anti-diabetic medicine dosage adjustment. Conjunctive work among health care professionals, such as physicians, pharmaceutical assistants, nurses, public health officers, and religious leader is crucial. Physicians are responsible for educating the team with medical concerns to prevent complications by organizing a meeting to educate the team on the importance of medicine dosage adjustment and diabetic self-management education. Medications should be prepared prior to Ramadan by pharmaceutical assistants and nurses based on physician's prescription. Moreover, during the religious education for the experimental group, the health care professional team is also educated with religious aspects and principles through open discussion with the local religious leader.

Table 2. General and clinical characteristics of the patients in the experimental and control groups

Characteristics of patients	Experimental group n = 62	Control group n = 28	*p*-value
Age (years)	56.26±9.481	54.79±9.85	0.502(1)
Sex (number/percentage)			
Male	9 (30.65)	5 (17.86)	0.204(2)
Female	43 (69.35)	23 (82.14)	
Body mass index (kg/m^2)	27.97±6.05	27.42±2.58	0.653(1)
Waist circumference (cm)			
Male	97.74±16.25	98.40±4.72	0.930(1)
Female	90.57±10.46	93.96±6.68	0.165(1)
Basic knowledge about diabetes score (10 points)	8.16±1.63	8.71±1.56	0.135(1)
Fasting plasma glucose (mg/dl)	154.92±63.09	168.39±58.61	0.341(1)
Hemoglobin A1c (%)	8.66±1.97	8.94±2.13	0.548(1)
Total cholesterol (mg/dl)	230.40±52.81	229.96±54.44	0.971(1)
Triglyceride (mg/dl)	172.45±88.33	181.64±91.89	0.653(1
LDL cholesterol (mg/dl)	141.60±43.10	144.64±50.18	)0.769(1)

Values are presented as means ± SD, n (%)
(1) Independent t-test, (2) Chi-square test

As a result, effectiveness is discussed as follows.

Based on the assessment after Ramadan, neither the experimental nor the control group exhibited any remarkable statistical differences with regard to weight, body mass index, waist circumference; moreover, there were no remarkable differences when comparing pre and post Ramadan periods. Because the follow-up pre and post Ramadan period lasted only 8 weeks, the difference might not be obviously noticeable. When fasting, food and drink are not prohibited during daytime; however, is not complete fasting, as there is eating and drinking during permitted nighttime. As a result, a number of physical changes could incur depending on each patient's self-management. Mean systolic and diastolic blood pressure of both groups were well controlled. The experimental group tended to have better control of blood pressure in terms of decreased diastolic (*p*-value = 0.041). This supported the belief that fasting promotes good health. It is due to the fact that more religious missions are performed during Ramadan.

The increased plasma glucose in the experimental group after Ramadan was a result from anti-diabetic medicines dose decrement and medicine change to prevent hypoglycemia (*p*-value = 0.037). The short-term acting medicine, Glipizide, was preferred over longer-term acting medicine, Glibenclamide. The decreased morning dosage was performed upon recommendation to prevent hypoglycemia. Adversely, it caused elevation of plasma glucose. However, the difference in mean plasma glucose of both experimental and control group, even though increased, was not remarkably prominent. Noted that, the control group's medicine was not changed nor adjusted prior to Ramadan. The control group omitted the midday dose, taking twice a day doses; the administered time was adjusted to follow the meal time.

In 2012, the mean number of fasting days of both groups was slightly lower than that of 2011. The experimental group succeeded, on average, with 19.18 days in 2012, while succeeded 20.03 days in 2011. The control group succeeded 17.75 days in 2012, while succeeded 18.89 days in the prior year. The percentage of those succeeded more than 15 days fasting were 61.3% and 60.7%, which was lower than the EPIDIAR study[5] on Muslim diabetes mellitus patients in 13 countries. The Muslims with diabetes mellitus type 2 in the EPIDIAR study succeeded 27 days fasting on average, among those, 78.7% succeeded at least 15 days. Clearly, the Thai Muslims with diabetes mellitus type 2 tended to be more relaxed in their fasting. They did not overly push the fasting if they find themselves in an uncomfortable state. They had a tendency to end the fasting if any self-assessed physical illnesses were noticed. Moreover, there were a number of reasons that fasting may be omitted as well. Good examples were feeling uncomfortable, menstruation period, hard work and travelling.

In behavioral aspects, it was found that the experimental group consumed less sweetened food by 42.5%, while the control group was 10.7% (*p*-value = 0.002). EPIDIAR study showed that Muslim diabetes

Table 3. Comparison of the mean of anthropometric measurement, blood chemistry measurement and fasting duration between both groups

Parameters	Experimental group n = 62	Control group n = 28	*p*-value[1]
Anthropometric			
Weight before Ramadan (kg)	70.21±16.16	66.14±7.52	0.208
Weight after Ramadan (kg)	69.70±15.95	66.00±7.92	0.248
p-value[2]	0.148	0.681	
Body mass index before Ramadan (kg/m^2)	27.97±6.05	27.42±2.58	0.653
Body mass index after Ramadan (kg/m^2)	27.77±5.99	27.36±2.55	0.734
p-value[2]	0.124	0.677	
Waist circumference (male) before Ramadan (cm)	97.74±16.25	98.40±4.72	0.930
Waist circumference (male) after Ramadan (cm)	98.21±16.92	99.80±8.23	0.842
Waist circumference (female) before Ramadan (cm)	90.57±10.46	93.96±6.68	0.165
Waist circumference (female) after Ramadan (cm)	90.14±10.98	93.78±6.02	0.146
p-value[2] male	0.582	0.567	
p-value[2] female	0.448	0.764	
Systolic blood pressure before Ramadan (mmHg)	139.00±22.33	136.18±19.20	0.564
Systolic blood pressure after Ramadan (mmHg)	134.74±19.78	136.79±18.58	0.645
p-value[2]	0.141	0.893	
Diastolic blood pressure before Ramadan (mmHg)	83.48±11.11	82.04±7.67	0.534
Diastolic blood pressure after Ramadan (mmHg)	80.05±11.07	80.82±10.34	0.755
p-value[2]	0.041*	0.525	
Blood chemistry			
Fasting blood sugar before Ramadan (mg/dl)	154.92±63.09	168.39±58.61	0.341
Fasting blood sugar after Ramadan (mg/dl)	171.26±74.34	165.43±49.95	0.707
p-value[2]	0.037*	0.699	
Fasting duration[3]			
Fasting duration in the year 2011 (days)	20.03±10.75	18.89±6.72	0.636
Fasting duration in the year 2012 (days)	19.18±10.99	17.75±10.03	0.572
p-value[2]	0.405	0.487	

Values are presented as means ± SD
(1) independent t-test, (2) pair t-test, (3) fasting duration = days that patients can fast
* significant at $p<0.05$

mellitus type 2 patients consume less sweetened food by 24.7%. The less consumption of sweetened food was an important recommendation for the patients to follow during Ramadan. This was because, the need to control weight and plasma glucose to prevent a rapid increment. The patients clearly consume more water, 40.3% in the experimental group and 46.4% in the control group consume more water daily. This additional water intake was a major factor to prevent dehydration during Ramadan. In the EPIDAIR study[5], it was shown that Muslims with diabetes mellitus type 2 patients consumed more water by only 20.3%. However, the study in Pattani, Thailand showed that the patients consumed more sugary beverage by 78.8% but consumed less water by 59.6%[16]. Anyhow, the patients in Phra Nakhon Si Ayutthaya, Thailand consume more water during fasting. As a result, there had been no report that a patient became severely dehydrated during fasting. In terms of daily energy usage, both experimental group and control group used less energy by 6.5% and 7.1%, respectively. It was found that the daily energy usage was not significantly reduced because most patients engaged in middle to low daily physical activity as a norm. They were mostly female homemakers. There were not many hardworking patients in the groups. Thus, most of the patients performed normal daily tasks such as housework and sell goods. In terms of sleeping, it was noticed that the patients has less sleep during Ramadan, 43.5% in the experimental group and 39.3% in the control group. It was because more missions that are religious had to be performed at nighttime. Moreover, the female

Table 4. Number and percentage of patients in both groups which anthropometry, blood chemistry and behavior changed, and the number of complication incidence during Ramadan

Parameters	Experimental group n = 62	Control group n = 28	*p*-value[1]
Anthropometric			
Weight loss after Ramadan	33 (53.2)	14 (50.0)	0.777
Waist circumference decrease after Ramadan	24 (38.7)	15 (53.6)	0.188
Systolic blood pressure decrease after Ramadan	35 (56.5)	12 (42.9)	0.232
Diastolic blood pressure decrease after Ramadan	35 (56.5)	14 (50.0)	0.569
Well controlled blood pressure[2] before Ramadan	11 (17.7)	9 (32.1)	0.128
Well controlled blood pressure after Ramadan	16 (25.8)	7 (25.0)	0.935
Blood chemistry			
Fasting blood sugar decrease after Ramadan	21 (33.9)	14 (50.0)	0.146
Well controlled fasting blood sugar[3] before Ramadan	29 (46.8)	8 (28.6)	0.104
Well controlled fasting blood sugar after Ramadan	21 (33.9)	8 (28.6)	0.619
Behavior during Ramadan			
Decrease daily physical activity during Ramadan	4 (6.5)	2 (7.1)	0.903
Decrease sleep duration during Ramadan	27 (43.5)	11 (39.3)	0.705
Decrease food intake during Ramadan	23 (37.1)	12 (42.9)	0.604
Increase fluid intake during Ramadan	25 (40.3)	13 (46.4)	0.587
Decrease sugar intake during Ramadan	28 (45.2)	3 (10.7)	0.002*
Complications			
Hypoglycemic symptoms during Ramadan	4 (6.5)	7 (25.0)	0.013*
Hyperglycemic symptoms during Ramadan	4 (6.5)	2 (7.14)	0.903
Severe hypoglycemia & admit during Ramadan	0 (0)	0 (0)	-
Severe hyperglycemia & admit during Ramadan	1 (1.6)	1 (3.6)	0.560
Fasting duration			
Fasting duration increase	18 (29.0)	11 (39.3)	0.335
Fasting ≥15 days in the year 2011	46 (74.2)	20 (71.4)	0.784
Fasting ≥15 days in the year 2012	38 (61.3)	17 (60.7)	0.959

(1) Chi-square test or Fisher exact test, (2) well controlled blood pressure is ≤130/80 mmHg, (3) well controlled fasting blood sugar is 70-130 mg/dl, *Significant at $p<0.05$

homemaker patients needed to wake up very early to prepare for predawn meal for family members each day, thus fewer hours to sleep. Some were able to adjust themselves to less sleep, while some needed to sleep during daytime as compensation.

In terms of complications, it was found that there was no severe hypoglycemia incidents during the present study in either group. The experimental group, for which dosage adjusted anti-diabetic medicine was prescribed, exhibited low incidence of hypoglycemia. 6.45% of the experimental group exhibited the symptoms, for example, fainting, palpitations and sweating. However, 25% of the control group exhibited such symptoms (*p*-value = 0.013).

In summary, in order to achieve a better result in patient preparation for Ramadan, the belief, culture, tradition and community calendar has to be considered in the health education as well. The patient preparation before Ramadan has to be performed as well as patient self-management education and support. Moreover, local religious leaders should participate in the health education and make joint-decisions on health care in order not to violate any religious doctrine. This approach of health education results in more cooperation from the patients. They must pay more attention to the education and actively exchange questions with the physicians and religious leader, resulting in good overall satisfaction with the activity.

Conclusion

The primary health care services to prepare the patient prior to Ramadan by educating Thai Muslim diabetes mellitus type 2 patients with medical approach, medicine dose adjustment in conjunction with religious belief in the fasting and proper food consumption will result in the better patient self-management and reduce

the incident of severe complication during Ramadan.

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What is already known on this topic?

The patient preparation and anti-diabetic medicine dosage-adjustment for diabetic Muslim patients prior to Ramadan prevent severe complications.

What is this study add?

In order to give precautionary care to diabetic Muslim patients prior to Ramadan, knowledge with regard to diabetes mellitus, e.g. food, medicine dose-adjustment and other preparation protocols should be established in conjunction with religious fasting beliefs and principles in the form of health education and group activities through local religious leaders. Thus, the patient is able to manage him/herself and seek medical attention during Ramadan to prevent severe complications.

Potential conflicts of interest

None.

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ประสิทธิผลของการให้สุขศึกษาตามบริบทเพื่อการดูแลเบาหวานด้วยตนเองในผู้ป่วยชาวไทยมุสลิมที่เป็นเบาหวานชนิดที่ 2 ในเดือนรอมฎอน

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ภูมิหลัง: *การถือศีลอดในเดือนรอมฎอนส่งผลต่อสุขภาพของผู้ป่วยชาวมุสลิมที่เป็นเบาหวาน กลยุทธ์ที่เหมาะสมในการเตรียมผู้ป่วยก่อนเข้าสู่เดือนรอมฎอน คือการให้สุขศึกษาที่เหมาะสมและการปรับยาเบาหวานในช่วงเดือนรอมฎอน*

วัตถุประสงค์: *เพื่อศึกษาผลของระบบบริการรูปแบบเฉพาะที่มีการให้สุขศึกษาควบคู่กับการให้คำแนะนำโดยผู้นำศาสนาอิสลาม*

วัสดุและวิธีการ: *แบ่งกลุ่มผู้ป่วยชาวไทยมุสลิมที่เป็นเบาหวานชนิดที่ 2 เป็นสองกลุ่ม ผู้ป่วย 62 รายในกลุ่มทดลองได้รับบริการรูปแบบเฉพาะสำหรับผู้ป่วยเบาหวานชาวไทยมุสลิม มีการให้สุขศึกษาก่อนเข้าสู่เดือนรอมฎอนและมีการปรับยาเบาหวานระหว่างถือศีลอด โดยมีผู้ป่วย 28 ราย ในกลุ่มควบคุมได้รับบริการรูปแบบเดิม เมื่อสิ้นสุดเดือนรอมฎอนมีการติดตามสัมภาษณ์ ชั่งน้ำหนัก วัดความยาวรอบเอว วัดความดันโลหิต และเก็บตัวอย่างเลือดเพื่อส่งตรวจทางห้องปฏิบัติการ*

ผลการศึกษา: *ค่าเฉลี่ยความดันโลหิตทั้งสองกลุ่มอยู่ในเกณฑ์ควบคุมได้ดีและค่าเฉลี่ยลดลงเล็กน้อย หลังเดือนรอมฎอนทั้งสองกลุ่มไม่แตกต่างกัน กลุ่มทดลองมีค่าเฉลี่ยความดันโลหิตค่าไดแอสโทลิก (diastolic) ลดลงหลังเดือนรอมฎอน (p-value = 0.041) ในด้านพฤติกรรมพบว่ากลุ่มทดลองมีการรับประทานของหวานลดลง (p-value = 0.002) ในด้านภาวะแทรกซ้อนพบว่าทั้งกลุ่มทดลองและกลุ่มควบคุมไม่มีอุบัติการณ์ของภาวะระดับน้ำตาลในเลือดต่ำรุนแรงในเดือนรอมฎอน กลุ่มทดลองที่ได้รับการปรับยาเบาหวานมีจำนวนและร้อยละของอาสาสมัครที่มีกลุ่มอาการระดับน้ำตาลในเลือดต่ำน้อยกว่ากลุ่มควบคุม (p-value = 0.013)*

สรุป: *ระบบบริการรูปแบบเฉพาะโดยการให้สุขศึกษาควบคู่กับการให้คำแนะนำโดยผู้นำทางศาสนา และการปรับยาเบาหวานในช่วงเดือนรอมฎอน มีประสิทธิผลที่ดีต่อพฤติกรรมของผู้ป่วยเบาหวานในการลดการรับประทานอาหารหวาน เพื่อควบคุมระดับน้ำตาลในเลือด การถือศีลอดส่งผลดีต่อสุขภาพในการควบคุมความดันโลหิตและการปรับยา เบาหวานสามารถป้องกันภาวะแทรกซ้อนน้ำตาลในเลือดต่ำรุนแรงและลดอาการน้ำตาลในเลือดต่ำได้ รูปแบบการให้บริการนี้เหมาะสมกับผู้ป่วยชาวไทยมุสลิมที่เป็นเบาหวานชนิดที่ 2*