ผลของการติดตามการให้โปรแกรมสุขศึกษาและการสัมภาษณ์เพื่อสร้างแรงจูงใจ ในระยะเวลา 1 ปี ต่อระดับไขมันในเลือดของผู้ป่วยเบาหวานชนิดที่ 2

Effects of One-Year Follow-up of a Group-Based Type 2 Diabetes Health Education Program and Motivational Interviewing Intervention on Lipid Profile Among Type 2 Diabetes Patients

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บทคัดย่อ

การวิจัยนี้เป็นการวิจัยกึ่งทดลองระยะเวลา 1 ปี เพื่อติดตามการให้โปรแกรมสุขศึกษา และการสัมภาษณ์ เพื่อสร้างแรงจูงใจของผู้ป่วยเบาหวานชนิดที่ 2 ต่อระดับไขมันในเลือดกลุ่มตัวอย่าง คือ ผู้ป่วยเบาหวานชนิดที่ 2 จำนวน 70 คน ที่โรงพยาบาลส่งเสริมสุขภาพตำบลหนองนาคำ อำเภอเมือง จังหวัดอุดรธานี โดยการนัดผู้ป่วยมารับยาทุกๆ 2 เดือน ครั้งแรกและ ครั้งสุดท้าย พยาบาลจะเจาะเลือดเพื่อตรวจหาค่าโคเลสเตอรอล ไตรกลีเซอไรด์ ไขมันดี และไขมันไม่ดี จากนั้นผู้ป่วยจะได้รับโปรแกรมการให้สุขศึกษา และแบบสำรวจการติดตามผลการให้โปรแกรมสุขศึกษาฉบับย่อ และกลุ่มตัวอย่างจะได้รับการสัมภาษณ์เพื่อสร้างแรงจูงใจ และแบบสำรวจการติดตามผลการให้โปรแกรมการสัมภาษณ์เพื่อสร้างแรงจูงใจ การวิจัยครั้งนี้วิเคราะห์ข้อมูล โดยใช้โปรแกรม STATA 13, Texus USA 2007 คือ ค่าเฉลี่ย ($\bar{X}$) และส่วนเบี่ยงเบนมาตรฐาน (S.D.) และ paired t-test

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ผลการศึกษาพบว่าผู้ป่วยเบาหวานชนิดที่ 2 ที่เป็นกลุ่มตัวอย่าง 70 คน เป็นเพศหญิง จำนวน 62 คน (ร้อยละ 88.57) อายุเฉลี่ย 60 ปี (S.D. = 6.70) ดัชนีมวลกายส่วนใหญ่อยู่ในช่วงน้ำหนักเกิน 34 คน (ร้อยละ 48.57, เฉลี่ย = 25.03 (S.D. = 4.10) มีรอบเอวเกินค่ามาตรฐาน 12 คน (ร้อยละ 19.05) กลุ่มตัวอย่างมีประวัติเป็นโรคเบาหวานและได้รับยาอยู่ระหว่าง 1-12 ปี (เฉลี่ย 6.40 ปี) โดยมากที่สุดคือ น้อยกว่า 3 ปี ร้อยละ 40.00 รองลงมา คือ 10-12 ปี ร้อยละ 25.71 จากผลการศึกษาระดับของไขมันในเลือดได้แก่ คอเลสเตอรอล ไตรกลีเซอร์ไลด์ คอเลสเตอรอลชนิดดี และคอเลสเตอรอลชนิดไม่ดี ก่อนการทดลอง พบว่าไม่แตกต่างจากค่าเฉลี่ยของไขมันในเลือดหลังการทดลอง (1 ปี) อย่างมีนัยสำคัญทางสถิติ (p=0.67, p=0.43, p=0.81, p=0.55 ตามลำดับ)

คำสำคัญ: โคเลสเตอรอล โปรแกรมสุขศึกษา การสัมภาษณ์เพื่อสร้างแรงจูงใจ

ABSTRACT

The 1 year quasi-experimental study aimed to investigate the effect of one-year follow-up of a group-based type 2 diabetes health education therapy and motivational interviewing intervention on lipid profile among type 2 diabetes patients. Subjects were 70 type 2 diabetes mellitus (DM) patients at Nongnakham primary care unit, Muang District, Udon Thani Province. Initially, the routine of participants came to primary care unit for medication every 2 months. First of all, all participants had drawn blood sampling by nurse to test total cholesterol (TC), triglycerides (TRI), high-density lipoprotein cholesterol (HDL-c) and low-density lipoprotein cholesterol level (LDL-c) (pre-intervention and post-intervention) followed by received face to face health education and the standardize of the followed health education program and motivational interviewing for changing behavior. Descriptive statistics were frequency, percentage, mean, standard deviation (S.D.) and paired t-test.

The results showed that, among 70 DM participants, most of them were 62 female (88.57%), age average 60 years old (S.D. = 6.70), 34 DM participants had BMI in over weight level (48.57%, $\overline{X}$ = 25.03, S.D. = 4.10), 12 female patients had over waist circumference (19.05%). Participants had DM underlying and take meditation for 1-12 years ($\overline{X}$ = 6.4 years), of those, most of them had DM underlying and take meditation for lower 3 years (40.00%) followed by 10-12 years (25.71%). The results of lipid profile level are consisted of total cholesterol, triglycerides, high-density lipoprotein cholesterol and low-density lipoprotein cholesterol level compare between pre-intervention and post- intervention found that all variables were not significantly different. (p=0.67, p=0.43, p=0.81, and p=55 respectively).

Keywords: Total Cholesterol, Health Education Program, Motivational Interviewing Intervention

Introduction

Cardiovascular diseases (CVD) are a major cause of death in developed countries (Grundy et al., 2018, pp. 1-11). CVD have a multifactorial origin, and dyslipidemia is one of the main risk factors for this type of disease. Atherosclerotic risk factors accelerate cardiovascular disease, a leading cause of morbidity and mortality in adults (Miller & Akohoue, 2017, pp. 57-61) especially those have dyslipidemia. Most of the prevention program are reduce risk factor of cardiovascular diseases, one of the favorite program is change diet behavior and their life style; decrease high fat food and increase activities and exercise. The European Society of Cardiology and Other Societies on Cardiovascular Disease Prevention in Clinical Practice suggest that the best practice to reduce risk of CVD is beginning to change diet behavior and their life style and practice for the doctor's advice (American Association of Clinical Endocrinologists and American College of Endocrinology, 2015, p. 117).

According to the American Diabetes Association reported that type 2 diabetes mellitus (TD2) is cause of death in world wide (Centers for Disease Control and Prevention, 2016) especially traditional diet behavior but lack of exercise leading to type 2 diabetes mellitus. In addition, they suggested that type 2 diabetes mellitus patients who received diet control program can decrease fasting blood sugar, blood pressure and lipid profile (Bantle et al., 2008, pp. s61-s78). Most problems that prevent diabetic patients are changing diet local food culture behavior each a day and lack of motivation to change diet behavior (Miller, 2011, pp. 1239-1252). Lipid profile test is an appropriate method to plan for reduce complications as follow especially capillaries damage (Koro, Bowlin, Bourgeois & Fedder, 2004, pp.17-20). Grundy et al.

(2018) reported that the normal values of lipid profile consisted of total cholesterol < 200 mg/dL (< 5.1 mmol/L), triglycerides < 130 mg/dL (< 1.4 mmol/L), high-density lipoprotein cholesterol: (HDL-c) < 40 mg/dL (< 1.0 mmol/L) and low-density lipoprotein cholesterol: (LDL-c) < 130 mg/dL (< 3.4 mmol/L). Stratton et al. (2000) suggested that patients who were cholesterol > 170-199 mg/dL (4.3-5.1 mmol/mol), triglycerides 90-129 mg/dL (1.0-1.5 mmol/L), high-density lipoprotein cholesterol: (HDL-c) 40-45 mg/dL, 1.0-1.2 mmol/L) and low-density lipoprotein cholesterol: (LDL-c) 110-129 mg/dL, 2.8-3.3 mmol/L) significant associated with capillaries damage.

Motivational Interviewing (MI) is a collaborative, person-centred approach to working with people in order to elicit and strengthen their motivation and commitment to change. It has been found to be more effective than traditional advice-giving in the treatment of a range of behavioral problems and diseases, including diabetes (Resnicow et al., 2015, pp. 649-657). According to Miller & Akohoue (2017) who studied the effect of two-year follow-up of a group-based type 2 diabetes health education therapy and motivational interviewing intervention in 12 American DM patients they found that, total cholesterol in post-intervention (8.8%) had decreased significantly compared with total cholesterol in pre-intervention (10.25%), including the behavior of eating high fat foods had decreased but the behavior of fruit and vegetable intake had increased. On the other hand, there is a study of the effectiveness of meal and exercise behavior modification among 536 type 2 diabetes mellitus patients in primary health care in Netherland. Eligible participants were randomized into two groups: the intervention group (n = 283) received motivation program 6 - 8 times/first 6 months

including family counseling, food intake and exercise behavior modification and the control group (n = 253) whose routine activities of daily living, found that compared between food intake group and exercise behavior modification group had not significantly different. (Whittemore, Melkus, Sullivan & Grey, 2004, pp. 795-804)

In Thailand, department of control disease, Ministry of public health (2018) reported that the number of non-communicable disease patients especially diabetes had been increasing every year from 2012-2014. In 2012-2014, DM cases were 674,826, 698,720 and 670,664, respectively. In Udon Thani province, in 2012-2014, DM cases were 16,708, 17,853, 18,140, respectively. (Ministry of public health, 2018). The statistics of total population of Nongnakham sub-district, muang district, Udon Thani province (2017), total population were 13,988, some of these had population who were over 35 years old (4,217), and 475 DM patients (311 type 2 diabetes mellitus patients (HbA1c 7.00-10.00 %) who take medication at Nongnakham primary care unit) (Nongnakham Primary Care Unit, 2018). The processing of treatments of DM patients at Nongnakham primary care unit consists of medication, draw blood sampling by a nurse to test lipid profile, health education and motivational interviewing (MI) to help DM patients understand better about their sickness and its preventive measures. The real problem of the villagers is poverty that increases their risk factors. Most of the people are poor that every day they had a traditional Northeast Thailand diet which is very spicy and high in sugar and salts, the risk factors of type 2 diabetes mellitus. Therefore, the means to decrease high risk of type 2 diabetes mellitus (DM) is the evaluation of health education program and motivational interviewing intervention.

Objective

The 1 year quasi-experimental study aimed to investigate the effect of one-year follow-up of a group-based type 2 diabetes health education program and motivational interviewing intervention on lipid profile among type 2 diabetes mellitus (DM) patients.

Methodology

1. Subjects

The 1 year (1 october 2017-30 september 2018) quasi-experimental study. Subjects were 70 patients with type 2 diabetes mellitus at Nongnakham primary care unit, Muang district, Udon Thani province. Inclusion criteria; ages 35-70 years old who were underlying 2 diabetes mellitus (HbA1c 7.10-10.00%) and take medication less than 1 year. All of them had drawn blood sampling by a nurse to test lipid profile 2 times (pretest and post-test) 1 years ago. (Figure 1)

2. Intervention

The intervention group received health education program and the contents was designed unit base on MI theory as follow. First, all participants visited Nongnakham primary care had blood sampling by a nurse to test lipid profile (pretest-posttest) (Figure 1) followed by a face to face health education program and the standardized health education program, consist of:

2.1 Seven domains of motivation which were as followed my activities of daily living has caused problems for other people, I take medication continuously, some people think that I can't be DM, Being that I having to lie to other people just to take medication to make me unhappy, Some people try to avoid me when I am taking medication, Taking medication makes work lost, My family feel disappointed because of my take

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medication, and I lose trust and respect from my family because of take medication).

2.2 Ten domains of problems and obstacles which were as followed I like myself more when I take medicine for DM, Taking medication helps me to deal with problems, Taking medication makes me fun and can get along with other people, Taking medication makes me a fun person, Taking medication allows me to fully express, Taking medication gives me strength and keeps my life going, I feel more confident when I take medicine, If I am not take medication makes me feel bored and lifeless, my family like me more when I take medication and Not take medication makes me feel bad).

2.3 Eleven domains of motivational interviewing which were as followed I want to seriously change my take medication, If I don't change about medication soon, I will get worse, I have started to change about my medication, I am not just thinking about changing my medication habits, but I am preparing to do something, I have started to change my medication, I am seriously trying to reduce medication, I need help to return to take medication, I know that I have a problem with medication, There are times when I suspect that I use too much of medication, I try a lot to change my medication habits and I have changed something about take medication.) (Toobert et al., 2000, pp. 943-950).

After each diabetic patient receives MI- the points are collected and interpreted as follows: item 1, 3, 14 and 19 (4 - 20-points) are recognition item 16 (1 - 5-points) ambivalence, and item 4, 8, 9, 13, 15 and 16 (6 - 30-points) are taking-steps. Second, all patients received motivational interviewing (MI). This is a collaborative, person-centred approach to working with people in order to elicit and strengthen their motivation and commitment to change. It has found to be more effective than traditional advice-giving in the treatment of a range of behavioral problems and diseases, including diabetes (Miller & Rollnick, 2002, p. 271). According to expertise, they found that motivational interviewing has been more effectiveness to decreased total cholesterol and triglycerides than general health education (Whittemore et al., 2004, pp. 795-804). Finally, all patients received the standard checklist of follow-up motivational interviewing (Lane, Huws-Thomas, Hood, Rollnick, Edwards & Robling, 2005, pp. 166-173), consisting of 11 domains of behavior change (likert scale 0-4, 0 = never, 1 = rarely, 2 = sometime, 3 = often, 4 = always). Interpretation of the score as recognition (20. Points is always, 17-19. is often, ≥ 16- is-sometime), ambivalence: (5 points is always, 4. is often, ≥ 3.is sometime), taking steps: (28 - 30-points is always, 25-27 is often, ≥ 24 is sometime)

3. Statistical analysis

Statistical analysis used STATA 13 and Texus USA 2007. S - wilk test was used to test the normal distribution of values. Descriptive statistics were frequency, percentage, mean and standard deviation (S.D.) to express demographic and body composition. Inferential statistic was paired t-test used to compare lipid profile (pre-test and post-test) at 95% confidence interval. We used $p < 0.05$ as the cut-off point of statistical significance.

Results

1. Demographic and body composition (base line)

Most participants were female (n = 63, 90.00%), age between 35-75 years old ($\overline{X}$ = 60, S.D. = 6.70), some of them were overweight (n = 32, 45.71%, $\overline{X}$ = 25.02, S.D. = 4.20), all males had standard waist

circumference but 12 females had over standard waist circumference (19.05%). All participants had average underlying type 2 diabetes mellitus 6.40 years (0.7-14 year). (Table 1)
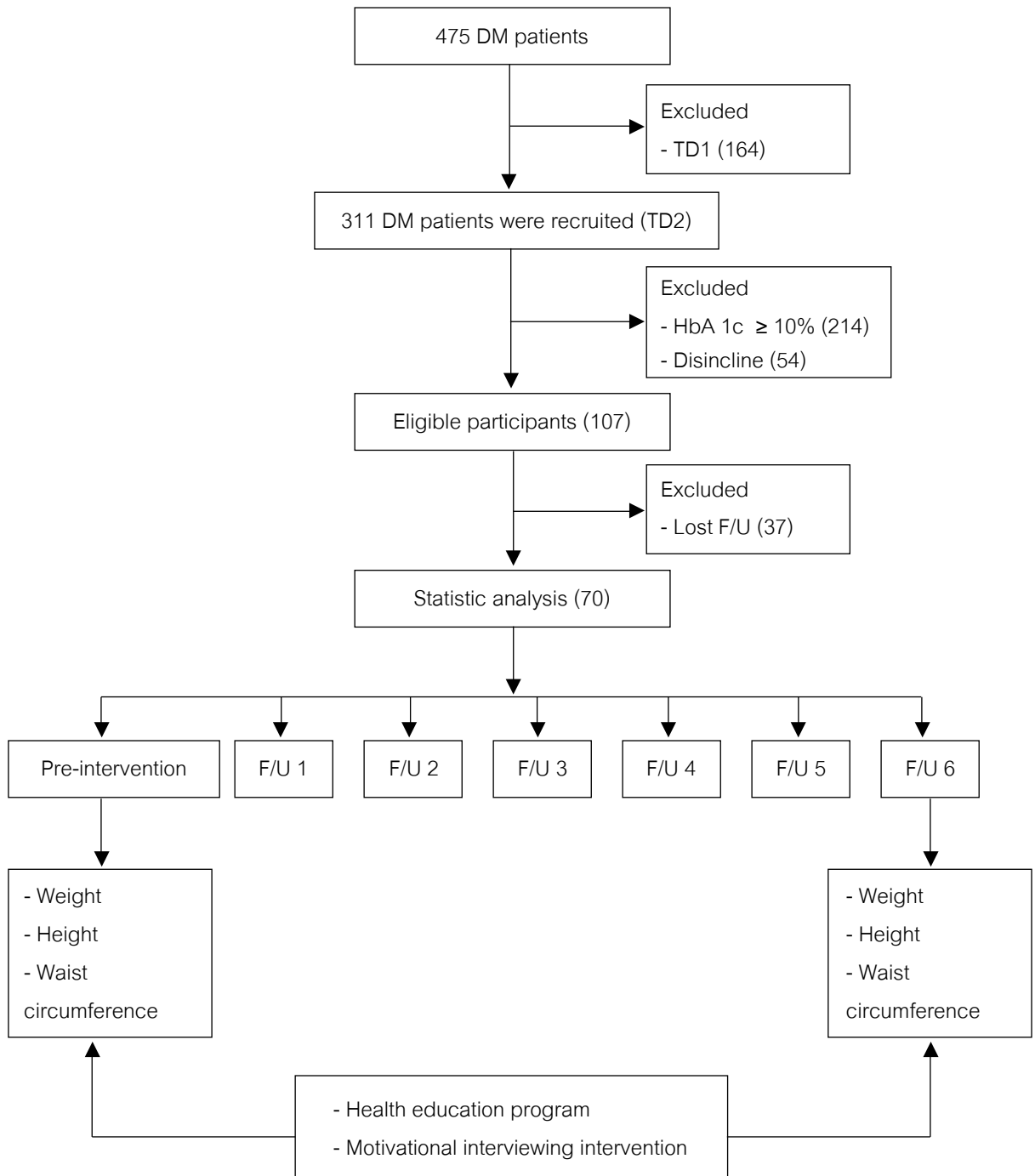

Figure 1 Study process of this study

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Table 1 Demographic and body composition (pre-test)

Variable	n (%)	Variable	n (%)
Sex		Waist circumference (male)	
Male	7 (10.00)	Standard	7 (100)
Female	63 (90.00)	Over standard (>90 cm)	0 (0)
Body mass index (BMI)		Waist circumference (female)	
Under weight (≤19.99)	7 (10.00)	Standard	51 (80.95)
Healthy weight (20-24.99)	31 (44.29)	Over standard (>80 cm)	12 (19.05)
Over weight (≥ 25)	32 (45.71)	$\overline{X}$ = 75.05 (5.66) Min-max (56-95)	
$\overline{X}$ = 25.02 (4.20) Min-max (17.31-38.05)			
Age (year)		DM underlying	
30-39	≤ 3 years	28 (40.00)	
40-49	4-6 years	4-6 years	14 (20.00)
50-59	7-9 years	7-9 years	3 (4.29)
60-69	10-12 years	10-12 years	18 (25.71)
≥70	≥13 years	≥13 years	7 (10.00)
$\overline{X}$ = 60 (6.70) Min-max (35-75)		$\overline{X}$ = 6.40 (4.39) Min-max (0.7-14.00)	

2. Waist circumference and body mass index

The use of paired t-test assumes that all the populations are normal distributed, all the populations variances are equal and are randomly collected from their population (Munro, 2005). At pre-test and post-test as waist circumference mean were 75.27 and 75.20, respectively, body mass index mean were 25.14 and 25.03, respectively. The results found that both of waist circumference and body mass index (pre-test) were not significantly different from post-test ($p=0.09$ and $p=0.45$, respectively). (Table 2).

Table 2 Waist circumference and body mass index at pre-test and post test (n=70)

	Paired Differences					t	df	p-value
	Mean different	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Waist circumference	0.07	0.35	0.42	-0.01	0.16	1.69	69	0.09
Body mass index	0.11	1.18	0.14	-0.17	0.39	0.77	69	0.45

3. Total cholesterol and triglycerides

At pre-test and post-test as total cholesterol mean were 190.21 and 187.16, respectively, triglycerides mean were 167.80 and 160.93, respectively. The results of total cholesterol and triglycerides found that both variables (pre-test) were not significantly different post-test (p=0.67 and p=0.55, respectively). (Table 3).

Table 3 Total cholesterol and triglycerides at pre-test and post test (n=70)

	Paired Differences					t	df	p-value
	Mean different	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Total cholesterol	3.06	60.36	7.21	-11.33	17.45	0.42	69	0.67
Triglycerides	6.88	95.53	11.48	-15.90	29.66	0.60	69	0.55

4. High-density lipoprotein cholesterol: HDL-c) and Low-density lipoprotein cholesterol (LDL-c)

At pre-test and post-test as HDL-c mean were 43.96 and 45.47, respectively, LDL-c mean were 112.08 and 110.56, respectively. The results of HDL-c and LDL-c found that both variables (pre-test) were not significantly different post-test (p=0.43 and p=0.81, respectively). (Table 4)

Table 4 High-density lipoprotein cholesterol (HDL-c) at pre-test and post test (n=70)

	Paired Differences					t	df	p-value
	Mean different	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
High-density lipoprotein cholesterol	-1.51	16.09	1.92	-5.35	2.32	-0.79	69	0.43
Low-density lipoprotein cholesterol	1.53	52.10	6.23	-10.89	13.95	0.25	69	0.81

Discussion

The present results showed that most of type 2 diabetes patients. were females (n=63, 90.00%). According to Abdullah, Peeters, de Courten & Stoelwinder (2010) reported that females had a higher incident rate of diabetes than male because females have a lower metabolic rate than males due to obesity and over standard waist circumference that may develop to diabetes (75%) (Chavier-Roper, Alick-Ortiz, Davila-Plaza & Morales-Quinones, 2014, pp. 17-21). Abdullah et al. (2010) confirmed that being overweight increases the risk of type 2 diabetes by about 3 times and obesity increases the risk of type 2 diabetes by about 7 times and it is one of the reasons why patients cannot control blood sugar levels according to normal criteria. In addition, it was found that obesity is also associated with insulin resistance (Bonoraet al., 2001, pp. 2023-2029). The participants had an average of 6.40 years of diabetes underlying with most less than 3 years (40%), followed by 10-12

years (25.71%). This results tend to be in the same way as the results of the waist circumference and body mass index, there was not significant different when comparing before and after the experiment. Similarly, Franz et al. (1995) found that most diabetic patients whose waist circumference over the standard values (male > 90 cm, female > 80 cm) and those have BMI overweight (BMI > 25) cause of dyslipidemia. Female who were obesity level 1 that risk of dyslipidemia (47.29%). On the other hand, the National Cholesterol Education Program (NCEP) expert panel on detection, evaluation, and treatment of high Blood cholesterol in adults confirmed that female diabetic patients who had dyslipidemia may be standard waist circumference (37.33%) but male diabetic patients who had dyslipidemia with waist circumference over the standard values (57.21%) (Haghighatpanah, Nejad, Haghighatpanah, Thunga & Mallayasamy, 2018, pp. 167-174).

The present results of total cholesterol, triglycerides, high-density lipoprotein cholesterol and low-density lipoprotein cholesterol (pre-test) found that were not significantly different from total cholesterol, triglycerides, high-density lipoprotein cholesterol and low-density lipoprotein cholesterol (post-test) ($p = 0.67$, $p = 0.43$, $p = 0.81$, $p = 0.55$, respectively. Dsylipidemia is a chronic disease that is quite difficult to control. Therefore, the medical team must have a plan for treatment over a long time period and may change the treatment plan from time to time because the cholesterol level can rise or fall within a day or 2-3 days, depending on the health care behavior of patients. In this study is a health education program every 2 months for 1 year, therefore may make patients with high blood cholesterol unable to control cholesterol levels, particularly in those who do not strictly control health care behavior. American Diabetes Association (ADA) (2016) reported that the definition of health education program were to be any planned activity or set of activities aimed at increasing health literacy and developing life skills conducing to health (e.g. decision making, problem solving, critical thinking, interpersonal skills, stress management, coping with emotions). While, Boren et al. (2009) supported that health education program for long period may be not can reduce total cholesterol. Therefore the cooperation between diabetic patients and medical team are benefit. According to Hemmati, Razmara & Niazkhani (2017) found that the best practice of health education program is face to face

health education program, nevertheless it difficult way for many diabetic patients. So the most time-saving way is to give out brochures or booklets, including video teaching or listening the radio. But these methods have not yet been confirmed studies that can change the behavior of diabetic patients.

The key strength of this research

The key strength of this research is that can followed DM patients who are receiving intervention programs and avoid unwanted behaviors taught by nurses for 100% because patients have to come to take medication at primary care unit on a monthly. In addition, nurse can call to them for emphasize that patients really do seriously follow the nurse's instructions.

Conclusion

This research does not change any variables. This may be because MI-is not suitable for changes in blood lipid levels because of the reduction in lipid levels may take longer period, including many other treatment methods.

Present study is the routine to research of nurse practice among DM patients who were take medication at Nongnakham primary care unit, Muang district, Udon Thani. For further study should be study in a large group to get results that can actually apply to real change behavior DM patients for reduce blood lipid level.

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