Effects of Nursing Case Management of Buddhist Monks at Risk for Type 2 Diabetes: A Randomized Controlled Trial

Apichart Chaimai, Noppawan Piaseu, Chatsiri Mekwiwatanawong*

Abstract: Buddhist Monks in Thailand are at risk of type 2 diabetes because of difficulties in their lifestyle modification and require nursing management, for they consume foods containing high fat, sugar, and calories, commonly offered by people for merit making. This randomized controlled trial tested the effectiveness of the Nursing Case Management Program for Diabetes Prevention on their health behaviors and clinical outcomes. A total of 50 participants at risk for type 2 diabetes in a northern region of Thailand met the inclusion criteria. The participants from 50 different temples were randomly assigned into an experimental group (n=25) receiving a 12-week nursing case management program in addition to routine care and a control group (n=25) receiving only routine care. Health behaviors, fasting blood glucose, body mass index, and waist circumference were measured at baseline and week-12 after the program. Data were analyzed using descriptive statistics, Chi-square test, Independent t-test, and Paired t-test.

The results revealed that the experimental group after receiving the program had significantly higher health behaviors and lower clinical outcomes than those before receiving the program. Differences in health behaviors and clinical outcomes were significantly higher in the experimental group than those in the control group. Results suggest that the Nursing Case Management Program for Diabetes Prevention using lifestyle modification strategies should be applied in monks with clinical management monitoring to prevent or reduce the incidence of type 2 diabetes. However further testing of the Program is warranted with different samples of monks, preferably in longitudinal studies.

Pacific Rim Int J Nurs Res 2017; 21(4) 305-316

Keywords: Body Mass Index, Buddhist Monks, Clinical Outcomes, Fasting Blood Glucose, Nursing Case Management, Thailand, Type 2 Diabetes Mellitus, Waist Circumference.

Introduction

Type 2 diabetes mellitus (DM) is a major non-communicable disease (NCD) with an increasing trend worldwide. The International Diabetes Federation (IDF) reported that in 2015 the prevalence in the general population and population at-risk of DM were 8.8% and 6.7%, respectively.[1] It has been estimated that by 2040 the prevalence will increase to 10.4% and 7.8%, respectively.[1] In Thailand, the

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National Health Survey has reported that the prevalence of DM increased from 6.9% in 2009 to 8.9% in 2014 with14.2% of the population at-risk.[2]

Buddhist monks are considered a population at risk of DM due to their daily life concerning moral precepts, religious rules and regulations.[3] Most monks consume foods containing high fat, sugar, and calories, commonly offered by people for merit making.[4] Behavioral modification is therefore difficult for them, resulting in increased risks of DM. A health survey in Thai monks at the Priest Hospital, Bangkok revealed that majority of them had insufficient physical activity and exercise (82.6%), were not healthy (73.2%), had metabolic syndrome (46.5%), and a high fasting blood glucose (7.5%).[5] Thus, nursing case management (NCM) may be a useful strategy to help them lead healthier lives.

Nursing case management is an approach that is widely accepted for provision of care to persons with complex health and psychosocial problems. The processes of NCM consist of assessment, planning, and management to ensure that the persons receive care as needed.[7-9] A review of literature revealed the effectiveness of NCM in patients with complex problems.[4,8,10-23] However, there is no study reporting the effectiveness of NCM in Buddhist monks at risk of DM. Roles of community nurse practitioners generally focus on screening for risks or health problems, providing care, and monitoring to ensure effectiveness of care provision. Such roles are consistent with those of nurse case managers as indicated in the current policy of the Ministry of Public Health (MOPH). The primary investigator (PI), as a community nurse practitioner and nurse case manager, was therefore interested in testing effects of Nursing Case Management Program for Diabetes Prevention (NCMPDP or the Program) on health behaviors and clinical outcomes in Buddhist monks at risk of DM.

Review of Literature

Impaired fasting glucose (IFG) is a major risk factor of DM associated with high body mass index (BMI), and waist circumference (WC) resulting from unhealthy behaviors, particularly unhealthy diet and physical inactivity with advancing age and family history of DM.[24-27] According to the Clinical Practice Guideline[28], people older than 35 years should be screened for DM and monitored once a year to prevent DM.

Buddhist monks are considered as a population at risk of DM due to the aforementioned risks and a complexity related with the Fundamental Precepts (*Patimokkha*) regarding their prohibitions of food consumption and exercise, including not asking for more nutritious or healthier food to eat, and having food without offerings (*Bhojanapatisanyutt*). Monks should not receive excessive food, eat with greediness, and should not ask for food for their own benefit if they are not sick. Monks are able to exercise, but with carefulness for good faith. Exercise has to be done at an appropriate place.[3] Previous studies reveal that Thai monks perceive the health promoting benefits and significance of exercise and stress management,[18,22] but an incidence of impaired fasting glucose[29] and chronic illnesses, particularly hypertension and DM in 33% of Thai monks has also been reported.[19]

Nursing case management has been found to be effective in improving patients' quality of life and reducing cost of care.[7,10,30] A meta-analysis on the effectiveness of NCM reported that these interventions improved the quality of life and self-care ability of patients with chronic conditions.[31] It has been shown that patients with uncontrolled DM receiving NCM had significantly lower HbA1C level than those who did not receive NCM.[16] Thus, in this study, the researchers developed the NCMPDP to promote health behavior modifications in monks at risk for DM through the following processes: 1) health care needs assessment of general physical health to identify the cause of health problems; 2) careful planning for lifestyle modifications such as eating behaviors, exercise, emotional management, including participation of the monks in care planning, goal attainment, and self-management; 3) management of care. In this process, nurse case managers used

their competencies in order to achieve health outcomes such as clinical management, advocacy, health resource utilization and coordination of care; and 4) monitoring and evaluation.[7-10,30] The hypotheses were:1) the participants after receiving NCMPDP would have a higher mean score for health behaviors and lower clinical outcomes (FBG, BMI, and WC) than those before receiving the Program, and 2) the participants in the experimental group would have improved health behaviors and clinical outcomes (FBG, BMI, WC) than the control group.

Methods

Design: A randomized controlled trial was used.

Sample and settings: The participants included 50 monks at risk for type 2 DM living in 50 temples of two randomly selected districts in a northern Thai province between January and June 2016. The characteristics of these two districts were geographically and economically similar. Through simple random sampling, the participants were recruited according to the inclusion criteria: 1) residing in the temple for at least one year; 2) having FBG 100-125 mg/dl within a two-week interval, BMI > 22.9 kg/m^2 or WC ≥ 90 cms; and 3) being able to communicate in Thai. The exclusion criteria were: unable to continuously participate in the program sessions or suffering a serious illness during the study.

The sample size was determined using the G* Power Program based on the principle of power analysis and a meta-analysis on NCM of persons with DM.[32] The effect size was set at .86 with the significance level of .05, and the power at .80. The estimated sample size was 46; however, to prevent dropout, 10% was added, and thus a sample of 50 needed to be recruited. After the consents were given, the participants were randomly assigned into the control and experimental groups (Figure 1).

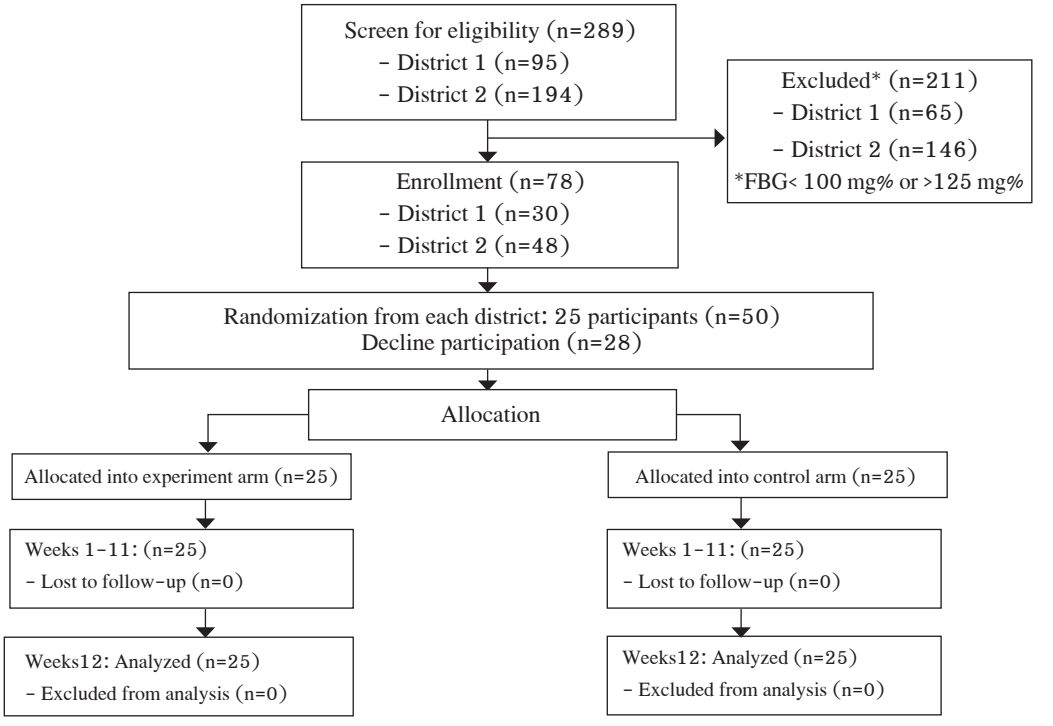

Figure1 Flow of participants

Ethical considerations: This study was approved by the Institutional Review Board on Research Ethics, Faculty of Medicine, Ramathibodi Hospital, Mahidol University No. 2558/515, and the Provincial Public Health Office No. 2/2559 with a permission for data collection from the provincial head monk. Potential participants were informed of research objectives and all processes, confidentiality, risks and benefits, and their rights and could ask any questions and withdraw from the study at any time. Informed consent was obtained from all participants.

Instruments:

The Demographic Characteristics Interview Protocol was developed by the PI to obtain data on age, duration of ordination, educational background, religious educational background, history of smoking, and chronic conditions.

The Health Behaviors Questionnaire was modified from the Health Behaviors of Monks Questionnaires developed by Chatvarat[19] in 2010 and Suthiwatjano[21] in 2013. There are 29 items with three subscales: nutrition (10 items), exercise (9 items), and emotional management (10 items). Examples of items were: "Not eating food containing high fat (nutrition)"; "Exercise by walking at least 30 minutes for five times per week (exercise)"; and "Emotional control when getting angry (emotional management)". The responses are given on a 5-point Likert scale, from the most to the least with possible scores ranging from 29 to 145. Higher scores indicate higher health behaviors to prevent DM. Cronbach's alpha coefficients of the original questionnaires were 0.81 and 0.85, respectively. The modified questionnaire was validated by three experts, a nurse specialized in DM care, a Buddhist monk, and a senior researcher on health behaviors of Thai monks, and obtained a content validity index (CVI) of 1. Reliability was also determined in a pilot of the questionnaire among 15 monks with characteristics similar to the sample, obtaining Cronbach's alpha coefficient at.93. For the main study, Cronbach's alpha coefficient was 0.89.

Fasting blood glucose was assessed from capillary blood at the fingertip after fasting for at least eight hours, and measured in mg%.

Body weight and height were assessed in the morning before breakfast using a digital weighing scale measured in kilograms and a height scale in centimeters. BMI was then determined from body weight in kilograms divided by the square of height in meters.

Waist circumference was assessed using a measuring tape in centimeters with the participants standing erect. The measuring tape was placed at the middle between the iliac crest and the lowest rib, with the tape parallel to the floor, measured during exhalation.

The blood examination tool, the digital weighing scale, the height scale, and the measuring tape were calibrated before use by the Medical Device Control Department at the provincial hospital.

Intervention: The NCMPDP intervention was developed by the PI based on the concept of NCM. It is composed of 10 sessions over a 12-week intervention period. The intervention given by the community nurse practitioner at each session lasted approximately 60 minutes depending on the participants' health care needs. The Program is individual intervention consisting of various strategies following nurse case manager's roles such as health assessment, planning, clinical management, coordination of care, coordination of health resources, and home and telephone visits (**Table 1**). The content was validated by the aforementioned three experts.

The routine care included: 1) advice for behavioral modification based on the basic principles of nutrition, exercise, and emotional management as described by the Thai Ministry of Public Health; 2) a pamphlet on knowledge of DM prevention; and 3) a follow-up on fasting blood glucose at three months.

Table 1: Schedule and Content of the Nursing Case Management Program for Diabetes Prevention

Week/Session	Content/Activity
	Assessment of health needs and planning for care
Week 1: Session 1 (60 mins) (60 mins)	Assessing participants' health behaviors, status, problems and needs Planning for behavioral modification in terms of nutrition, exercise, and emotional management for desirable clinical outcomes.
	Management of care as needed
Week 2: Session 2 (60 mins)	Provision of nursing case management care to manage health problems or modify inappropriate behaviors as previously planned in Week 1, ensure correct healthcare practices and prevent DM for desirable clinical outcomes based on competency of the nursing case manager including clinical management, protection of rights, coordination of health resources, and coordination of care. The PI: 1. Conducted clinical management by providing initial care when problems caused by health assessment were detected including performing initial examinations 2. Protected participants' rights, by making sure they had access to necessary healthcare including referring them for relevant treatment and care. 3. Coordinated available health resources by contacting related individuals, agencies, communities, or organizations to help promote health behaviors of participants at risk, and 4. Collaborated with the health network and the multidisciplinary team to help one another take care of participants at risk for DM.
(60 mins)	The PI disseminated knowledge on "Behavioral modification for monks at risk for DM" together with the use of various media entitled "Thai monks stay free from diseases" including giving a waist measuring tape, the "health starts with added steps" calendar, and the 'Thai monks stay free from diseases" poster, which were made in the media for the project of the Thai Health Promotion Foundation.
	Monitoring and evaluation
Week 3-4/once a week: Session 3-4 (5-15 mins)	PI conducted telephone follow-ups to monitor participants after health problems were managed on a case-by-case basis and to motivate them to continue managing their own health.
Week 5-8/once every two weeks: Session 5-6 (60 mins)	PI and related multidisciplinary team members conducted visits to the temples. The purpose of the visits was to follow up on behavioral modification so as to more appropriately offer advice and help solve health problems in each case. The PI and the team also gave the participants encouragement and moral support to motivate them to continue their healthcare practices.
Week 9-11/once a week: Session 7-9 (5-15 mins)	The PI conducted telephone follow-ups to monitor the participants after the health problems were managed on a case-by-case basis and to motivate the monks to continue managing their own health, in the same manner as the activities in Weeks 3 and 4.
Week 12: Session 10 (90 mins)	The PI assessed the participants' health behaviors, FBG, BMI, and WC after the Program and concluded the outcomes of the nursing case management. The PI explained changes to participants after they had received NCM. They discussed their behavioral modification experiences, and the PI gave further advice if they had doubts. Finally, the PI gave the participants praise, moral support, and encouragement to boost their confidence to continue their health behavioral modification.

Data collection procedures were divided into 2 phases:

Screening and recruitment phase: the PI and two research assistants (RAs), registered nurses who received specific training for the study screened the potential participants according to the screening guideline for type 2 DM in adults.[28] Appointments were made with those who met the inclusion criteria. Computer-generated random sampling was employed to select 50 monks at risk for DM, 25 from each district. Then, they were randomly assigned into either the control or experimental group (**Figure 1**).

Intervention implementation phase: after baseline was completed the participants in the experimental group received the NCMPDP (**Table 1**) in addition to routine care. They also received various media entitled "Thai monks stay free from diseases" including a waistband self-measuring tape, a calendar, and a poster developed by the Thai Health Promotion Foundation. The participants in the control group received only routine care.

In week 12, the PI assessed the participants' health behaviors and clinical outcomes in both groups, lasting approximately 90 minutes. The participants had a chance to share their experiences of behavioral modification, and the PI provided further advice based on the discussion. The participants with obesity were referred to the Diet Physical Activity Clinic (DPAC) for proper management by specialists. Finally, the PI gave the participants praise, moral support, and encouragement to boost their confidence to continue their health behavioral modification. For the participants in the control group, the PI conducted a lecture entitled "Health behavioral modification for monks at risk for DM" and gave them a set of media from the "Thai monks stay free from diseases" project for their behavioral modification. It was similar to the program that the experimental group received in the first week.

Data analysis: Demographic characteristics of the participants were analyzed using descriptive statistics and compared between the experimental and the control groups using chi-square test and independent t-test. Comparisons of health behaviors and clinical outcomes of FBG, BMI, and WC with the experimental group before and after the NCM were analyzed using the paired t-test and mean differences in health behaviors. The clinical outcomes between the experimental and control groups were analyzed using the independent t-test.

Results

Results in this study supported the hypotheses. There were no statistically significant differences in demographic characteristics between the control and experimental groups (**Table 2**). In the experimental group, after the NCMPDP, there were statistically higher overall health behaviors ($p<.001$) and results of the subscales of nutrition ($p<.001$), exercise ($p<.001$), and emotional management ($p=.002$) compared to those before the NCMPDP (Table 3). Also, after the NCMPDP, there were statistically lower clinical outcomes including FBG ($p<.001$), BMI ($p<.001$), and WC ($p=.004$) compared to those before the NCMPDP (**Table 3**).

Table 2: Comparison of demographic characteristics control and experimental groups before intervention (n=50)

Demographic characteristics	Control Group(n=25)		Experimental Group(n=25)		Statistics value	p-value
	Frequency	Percentage	Frequency	Percentage		
Age (years)					-.55[a]	.586
20-40	13	52.00	13	52.00		
41-60	8	32.00	11	44.00		
> 60	4	16.00	1	4.00		
Control Group: min = 21 years, max = 70years (= 42.80, S.D.=14.10)						
Experimental Group: min = 22years, max = 64 years (=40.84, S.D.=11.02)						
Duration of ordination (years)					.33a	.740

Table 2: Comparison of demographic characteristics control and experimental groups before intervention (n=50) (Cont.)

Demographic characteristics	Control Group(n=25)		Experimental Group(n=25)		Statistics value	p-value
	Frequency	Percentage	Frequency	Percentage		
1-5	10	40.00	8	32.00		
6-10	4	16.00	2	8.00		
> 10	11	44.00	15	60.00		
Control Group: min = 1 years, max = 40years (= 13.32, S.D.=11.50) Experimental Group: min = 1years, max = 46 years (=14.36, S.D.=10.54)						
Education					1.67[a]	.434
Elementary level	9	36.00	10	40.00		
Junior high school	3	12.00	0	0.00		
Senior high school	6	24.00	3	12.00		
Vocational certificate	3	12.00	5	20.00		
Bachelor degree	3	12.00	7	28.00		
Master degree or higher	1	4.00	0	0.00		
Pali studies					5.02[a]	.081
None	6	24.00	1	4.00		
Certificate of Dhamma study, Elementary level	2	8.00	3	12.00		
Certificate of Dhamma study, High school level	7	28.00	5	20.00		
Pali scholar level 3	6	24.00	6	24.00		
Pali scholar level 4-6	1	4.00	4	16.00		
Pali scholar level 7-9	3	12.00	6	24.00		
Smoking history					-	1.00[b]
Did not smoke	17	68.00	19	76.00		
Used to smoke	6	24.00	5	20.00		
Currently smoke	2	8.00	1	4.00		
Underlying diseases *(responses on more than one answer)*					2.00[c]	.157
No underlying diseases	10	40.0	16	64.00		
Underlying diseases	15	60.0	9	36.00		
Hypertension	6	35.30	7	50.00		
Obesity	5	29.40	0	0.00		
Coronary heart disease	3	17.70	0	0.00		
Hyperlipidemia	1	5.90	4	28.57		
Asthma	1	5.90	0	0.00		
Allergy	1	5.90	1	7.14		
Cerebrovascular	0	0.00	1	7.14		

a, Pearson Chi-Square; b, Fisher's Exact test; c, Chi-Square test (Continuity correction)

Table 3 Comparison of mean scores of health behaviors and clinical outcomes of control (n = 25) and experimental groups (n = 25) before and after Program using paired t-test.

Variable	Before		After		t	p-value
	mean	S.D.	mean	S.D.		
Overall health behaviors						
Control Group	77.28	14.01	78.00	13.36	1.91	.068
Experimental Group	70.72	6.72	89.28	11.73	8.27	<.001
Nutrition						
Control Group	21.68	5.68	23.00	5.97	2.14	.043
Experimental Group	19.28	3.55	29.12	4.14	10.01	<.001
Exercise						
Control Group	22.48	5.60	22.68	5.37	.82	.422
Experimental Group	20.96	2.79	26.40	3.81	7.64	<.001
Emotional management						
Control Group	32.32	5.8	32.32	5.66	.00	1.00
Experimental Group	30.48	3.62	33.76	5.80	3.45	.002
Fasting blood glucose (mg/dl.)						
Control Group	110.88	6.85	114.00	9.25	2.05	.052
Experimental Group	111.76	9.65	105.52	9.83	-5.46	<.001
Body mass index (kg/m^2)						
Control Group	26.95	6.74	27.53	6.58	3.30	.003
Experimental Group	25.91	4.09	24.44	3.90	-13.75	<.001
Waist circumference (cm.)						
Control Group	91.56	13.92	91.76	13.91	1.55	.134
Experimental Group	87.88	9.34	87.32	9.33	-3.22	.004

Comparisons of mean differences in health behaviors and clinical outcomes between the experimental and control groups using the independent t-test revealed that the experimental group had statistically higher mean differences in overall health behaviors (p<.001), and the subscales on nutrition (p<.001), exercise (p<.001), and emotional management (p=.002), FBG (p<.001), BMI (p<.001), and WC (p=.001) compared to those in the control group (Table 4).

Table 4 Comparison of mean differences (d*) in health behaviors and clinical outcomes before and after Program between control and experimental groups using independent t-test (n = 50)

Variables	Control Group (n=25)		Experimental Group (n=25)		Mean Difference	t	p-value
	d*	S.D.	d*	S.D.			
Overall health behaviors	1.52	3.98	18.56	11.23	-17.04	-7.15	<.001
Nutrition	1.32	3.09	9.84	4.91	-8.52	-7.34	<.001
Exercise	.20	1.23	5.44	3.56	-5.24	-6.96	<.001
Emotional management	.00	.96	3.28	4.76	-3.28	-3.38	.002
Fasting blood glucose (mg/dl.)	3.12	7.60	-6.24	5.72	9.36	4.92	<.001
Body mass index (kg/m^2)	.58	.88	-1.47	.54	2.05	9.96	<.001
Waist circumference (cm.)	.20	.65	-.56	.87	.76	3.51	.001

d* = Mean difference between before and after

Discussion

The results revealed that the NCMPDP was effective in improving health behaviors and clinical outcomes in monks at risk for DM. It could be explained that the Program facilitated problem solving and served the health needs of the participants. The diabetes prevention approach was integrated into the NCM to ensure that the participants with complexities received care that met their health needs.[7,10] These could be explained using the concept of NCM. First, assessment was done for health needs to identify the actual causes of health problems and health risk behaviors. Second, behavioral modification was planned. Third, health problems were managed through the nurse case manager's competencies by referring the participants with obesity to Diet Physical Activity Clinic for proper management by a specialist including the nutritionist. Dissemination of knowledge on "Behavioral modification to prevent DM" with supplementary media was also a suitable approach. This media appears to be a significant part of the intervention, as found in a previous study revealing that Thai monks receiving the media entitled "Thai monks stay free from diseases" had lower body weight and waist circumference.[35] Fourth, monitoring and evaluation using telephone follow-ups enabled the participants to clarify their doubts or queries and receive the advice they needed along with motivation and reminders during the telephone follow-up. Moreover, visiting the participants at the temple for follow-up supported continuous care and assistance from the PI and the multidisciplinary team.

In this study, the results were consistent with previous studies using NCM resulting in decreased HbA1c and FBG among patients with DM[16,33,34,36] including a synthesis of experimental research on development of care for such patients that indicated an effectiveness of NCM to improve outcomes.[37] A previous study also revealed the effectiveness of knowledge dissemination of food consumption on FBG, BMI, blood lipids and practices in Thai monks with DM.[38] Our study supported a meta-analysis[39] showing effectiveness of NCM to enhance clinical outcomes in patients with DM as well as a study aiming for risk reduction in persons at risk of coronary artery disease.[40]

The comparisons of mean differences indicated that the experimental group had greater changes in health behaviors and in clinical outcomes of FBG, BMI and WC than the control group (Table 4). These results confirm that the NCMPDP was effective for behavioral modification in Buddhist monks at risk for DM. It was evident that, after receiving the Program, 10 participants (40%) in the experimental group had decreased their FBG to normal levels while 5 participants (20%) in the control group were diagnosed with DM, and 20 participants (80%) remained at risk for DM. The results strongly support that the NCM can help prevent DM in monks at risk, in accordance with findings from previous studies.[16,38-39]

Limitations

This study focused on the implementation of the NCMPDP in monks who had not been diagnosed with DM. Other factors may need to be taken into consideration with continuous records of practices of the prescribed activities.

Conclusions and Implication for Nursing Practice

Results revealed that the NCMPDP could be an effective intervention to promote health behaviors and improve clinical outcomes including FBG, BMI, and WC in monks at risk for DM. Therefore, the Program could be applied for care of such monks through assessing their health risks and co-morbidity, prioritizing problems that need to be solved, devising a care plan, and implementing the plan based on individual health problems and health needs. Nurses can enlist cooperation from multidisciplinary teams

to ensure behavioral modification and health promotion for prevention of DM in this population. Further research needs to be conducted in longitudinal studies and more community involvement in different samples in different locations to test this Program, and refine it where necessary.

Acknowledgements

Thanks to all the study participants, the Graduate Studies of Mahidol University Alumni Association for funding, and the Potential Development of Thai People Project, Faculty of Medicine Ramathibodi Hospital for partial funding support.

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ผลของการพยาบาลแบบการจัดการรายกรณีในพระสงฆ์กลุ่มเสี่ยงต่อโรคเบาหวานชนิดที่ 2: การวิจัยแบบทดลองทางคลินิก

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บทคัดย่อ: การพยาบาลแบบการจัดการรายกรณีเพื่อการป้องกันเบาหวานมีความสำคัญสำหรับพระสงฆ์กลุ่มเสี่ยงต่อเบาหวานชนิดที่ 2 ที่มีความซับซ้อนในการปรับเปลี่ยนพฤติกรรมการวิจัยแบบทดลองทางคลินิกในครั้งนี้ มีวัตถุประสงค์เพื่อศึกษาผลของการพยาบาลแบบการจัดการรายกรณีต่อพฤติกรรมสุขภาพ และผลลัพธ์ทางคลินิก ได้แก่ ระดับน้ำตาลในเลือด ดัชนีมวลกาย และเส้นรอบเอวของพระสงฆ์ ตัวอย่าง คือ พระสงฆ์กลุ่มเสี่ยงเบาหวานชนิดที่ 2 ในจังหวัดทางภาคเหนือที่มีคุณสมบัติตามเกณฑ์คัดเข้า จำนวน 50 รายสุ่มเข้ากลุ่มทดลอง(25 ราย) ได้รับโปรแกรมการพยาบาลแบบการจัดการรายกรณี เป็นเวลา 12 สัปดาห์ร่วมกับการดูแลแบบปกติและกลุ่มควบคุม (25 ราย) ได้รับการดูแลแบบปกติเท่านั้น ตัวอย่างทุกรายได้รับการประเมินพฤติกรรมสุขภาพ ระดับน้ำตาลในเลือด ดัชนีมวลกาย และเส้นรอบเอว ในระยะก่อนและหลังโปรแกรม12 สัปดาห์ วิเคราะห์ข้อมูลด้วยสถิติบรรยาย การทดสอบไคสแควร์ การทดสอบทีอิสระ และการทดสอบทีคู่

ผลการวิจัย พบว่า ภายหลังได้รับการพยาบาลแบบการจัดการรายกรณี กลุ่มทดลองมีคะแนนพฤติกรรมสุขภาพมากกว่าและระดับน้ำตาลในเลือดดัชนีมวลกาย เส้นรอบเอวน้อยกว่าก่อนทดลองอย่างมีนัยสำคัญทางสถิติ กลุ่มทดลองมีการเปลี่ยนแปลงของพฤติกรรมสุขภาพระดับน้ำตาลในเลือด ดัชนีมวลกาย และเส้นรอบเอวมากกว่ากลุ่มควบคุมอย่างมีนัยสำคัญทางสถิติผลการศึกษานี้มีข้อเสนอแนะในการประยุกต์แนวทางการพยาบาลแบบการจัดการรายกรณี ในการดูแลติดตามระดับน้ำตาลในเลือด ดัชนีมวลกาย และเส้นรอบเอว เพื่อป้องกันการเกิดโรคเบาหวานชนิดที่ 2ในพระสงฆ์กลุ่มเสี่ยงเบาหวาน

Pacific Rim Int J Nurs Res 2017; 21(4) 305-316

คำสำคัญ: ดัชนีมวลกาย ผลลัพธ์ทางคลินิก ระดับน้ำตาลในเลือด พระสงฆ์ การจัดการรายกรณี เบาหวานชนิดที่ 2 เส้นรอบเอว

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