

ผลของโปรแกรมส่งเสริมสุขภาพเท้าต่อพฤติกรรมการดูแลเท้า ของผู้ป่วยเบาหวานชนิดที่ 2 อำเภอเมือง จังหวัดสุโขทัย Effects of Foot Health Promotion Program on Foot Care Behavior of Type 2 Diabetic Patients in Muang District, Sukhothai Province

นิพนธ์ต้นฉบับ

Original Article

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วารสารไทยเภสัชศาสตร์และวิทยาการสุขภาพ 2562;14(4):175-181.

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บทคัดย่อ

Abstract

วัตถุประสงค์: เพื่อศึกษาผลของโปรแกรมการส่งเสริมสุขภาพเท้าต่อพฤติกรรมการดูแลเท้าของผู้ป่วยเบาหวานชนิดที่ 2 **วิธีการศึกษา:** การวิจัยกึ่งทดลองนี้มีประชากร คือ ผู้ป่วยเบาหวานชนิดที่ 2 ใน อ.เมือง จ.สุโขทัยจำนวน 6,537 คน กลุ่มตัวอย่างจำนวน 60 คน แบ่งเป็น 2 กลุ่มคือ กลุ่มทดลองและกลุ่มควบคุมกลุ่มละ 30 คน ได้จากการสุ่มตัวอย่างแบบหลายขั้นตอน (multi-stage random sampling) เครื่องมือที่ใช้ได้แก่ โปรแกรมส่งเสริมสุขภาพเท้าโดยประยุกต์ใช้ทฤษฎีการดูแลตนเองโอเรมและเทลเลอร์ ซึ่งมีการพบปะและฝึกหัด 3 ครั้ง ใน 12 สัปดาห์ และแบบสอบถามพฤติกรรมการดูแลเท้าของผู้ป่วยเบาหวานชนิดที่ 2 ที่ให้ผู้ป่วยทั้งสองกลุ่มตอบคำถามก่อนและหลังโปรแกรม วิเคราะห์ข้อมูลโดยสถิติเชิงพรรณนา และใช้ paired sample t-test และ independent sample t-test สำหรับทดสอบความแตกต่างภายในกลุ่มและระหว่างกลุ่มตามระดับ **ผลการศึกษา:** ก่อนได้รับโปรแกรมส่งเสริมสุขภาพเท้า กลุ่มทดลองมีคะแนนพฤติกรรมการดูแลเท้าเท่ากับ 93.40 ± 13.45 และเพิ่มเป็น 107.33 ± 7.24 หลังได้รับโปรแกรม ในขณะที่กลุ่มควบคุมมีคะแนนเท่ากันทั้งก่อนและหลังได้รับโปรแกรม $(90.97$ และ 91.37 ตามลำดับ) และที่หลังโปรแกรม คะแนนในกลุ่มทดลองสูงกว่ากลุ่มควบคุมอย่างมีนัยสำคัญทางสถิติ (P -value < 0.05) **สรุป:** โปรแกรมส่งเสริมสุขภาพเท้าสามารถทำให้พฤติกรรมการดูแลเท้าของผู้ป่วยเบาหวานชนิดที่ 2 ดีขึ้น จึงควรนำโปรแกรมไปใช้ประยุกต์ใช้กับกลุ่มผู้ป่วยในพื้นที่อื่นต่อไป

Objective: To determine the benefit of a program to promote foot care behavior in type 2 diabetes **Method:** In this quasi-experimental research, the study population and sample were 6,537 and 60 type 2 diabetes patients in Muang district, Sukhothai province. A total of 30 participants each in experimental and control groups were selected through multi-stage random sampling. Research instruments consisted of a health promotion program for foot care behavior and a questionnaire on the behavior. Modeled after the concept of self-care of Orem and Taylor, the program had 3 sessions with a 12-week duration. The questionnaire was completed by the two groups both before and after the program. Descriptive statistics was used to present all information. Paired sample t-test and independent sample t-test were used to compare within- group and between- group differences, respectively. **Result:** Score of foot care behavior in the experimental group increased from 93.40 ± 13.45 points at baseline to 107.33 ± 7.24 points after the program. Scores in the control group remained the same (90.97 and 91.37 points, respectively). After the program, score of the behavior in the experimental group was significantly higher than that in the control group (P -value < 0.05). **Conclusion:** Foot care promotion program could improve foot care behavior in type 2 diabetes patients and should be implemented in a wider group of patients.

คำสำคัญ: โปรแกรมการส่งเสริมสุขภาพ, พฤติกรรมการดูแลเท้า, โรคเบาหวานชนิดที่ 2

Keywords: health promotion program, foot care behavior, type 2 diabetic

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Introduction

Diabetes mellitus is a non-communicable disease (NCD) that has been a major public health problem worldwide including Thailand. There have been 415 million diabetes patients worldwide and 1.5 million associated deaths.¹ In the US, in 2011, more than 25% of people aged 35 years or older had diabetes. In Thailand, the first 4 NCDs have been cardiovascular disease, cancer, diabetes, and chronic respiratory diseases.² As the third most NCD of Thailand in 2016, 5 million diabetes patients were found with a mortality rate of 15.48 100,000 populations.³

In Sukhothai province, the incidence of diabetes new cases has been continuously increasing with 5,702 per 100,000 populations in 2014. In Muang district of Sukhothai, in 2017, a total of 6,537 new diabetes cases or 7,732 per 100,000 populations. Most patients were in their 60 years of age or older and 98 deaths related to diabetes.⁴

Previous studies have shown that foot care behavior among diabetic patients could help avoid foot ulcer.⁵⁻⁸ However, 25% of these patients never took care of their feet.^{6,9} In diabetic patients, circulation in their feet decreases especially the distal part and the nervous system is

deteriorated. Poor glycemic control could further increase the risk of foot ulcer.¹⁰ Diabetes is a cause of foot ulcer in 19 – 25% of the patients and as high as 25% among the elderly.⁵

The deterioration of nervous system is the major factor of foot ulcer in diabetic patients.⁶ With a sensory loss, diabetic patients poorly perceive the heat and cold. Their feet could tolerate inappropriate pressure and friction longer. Their feet could be deformed and the skin could be thicker and callous. These conditions could lead to an easy ulceration in the foot which increases the risk of amputation of the toe and foot by 85%, the deterioration of mental health and quality of life, and eventually death.^{10,11} They could also face a high healthcare expenditure and a longer hospital stay when compared with other illnesses. With an expenditure as high as 127 times of other illnesses, healthcare expenditure for diabetic patients was 10,217 Baht per patient per year and could reach a total of 3,984 million Baht per year for all diabetic patients.¹²

There have been programs to promote foot care behavior based on various theories and concepts including Gibson's self-empowerment. In Thailand, there have been the program at sub-district health promoting hospitals in Klongsuan subdistrict of Samutprakarn province,¹³ the health belief model based program to prevent feet complications in type 2 diabetes patients at sub-district health promoting hospitals in Dongkhuang subdistrict of Nakhonpanom province¹⁴, and the program to develop self-care performance and glycemic control in type 2 diabetes patients at Lanska Hospital based on the Orem et al.'s self-care concept.¹⁵

In this present study, the investigator aimed develop and test the effects of a foot health promoting program based on Orem and Taylor's concept of self-care.¹⁶ According to the concept of self-care, Orem et al. asserted that self-care is practice initiated and maintained by the person to preserve their life, health and wellness. Self-care practice is intentional and purposeful. The process of self-care consists of a thorough consideration which leads to the actual practice and the evaluation against the goals set. Findings from our study could be useful for parties responsible for taking care of the patient's foot health and the diabetes patients themselves.

Specifically, this study aimed to determine foot care behavior and the effects of foot health promoting program on the foot care behavior in type 2 diabetes patients in a district of Sukhothai province. We hypothesized that patients participating in the foot health promoting program (test group) had a mean foot self-care behavior score higher than their

baseline, and higher than that in patients receiving the usual care (control group).

Methods

This study was quasi-experimental research with the two-group, pre-post test design. Study population was 6,537 type 2 diabetes patients residing in Muang district, Sukhothai province from February to April, 2019. Sample size was based estimated for an effect size of 0.71¹⁷, with an error of 0.05, a power of test of 0.80. A total of 27 participants in each group were required. To compensate for attrition, a total of 30 participants per group were needed resulting in 60 patients for the whole study.

With a multi-stage random sampling, a cluster random sampling was used to choose one out of nine districts of Sukhothai province. As a result, Muang district was selected in the first step of sampling. Of the 10 sub-districts of Muang district, Bansuan sub-district was selected in the second step. In the third step of selection, a simple random sampling on 13 villages of Bansuan sub-district selected village number 3 as experimental group and village number 1 as control group. In the last sampling step, a systematic sampling was used on the pool of diabetic patients in each of the two groups to be individual participants.

To be eligible in the study, the patients had to have type 2 diabetes and registered in the chronic disease clinic at Bansuan sub-district health promoting hospital, be able to perform daily living activities, be able to communicate in Thai, and be willing to join the study. However, patients who had urgent illnesses, had move from the study region (Bansuan sub-district), and withdrew from the study were excluded from the study.

Research instruments

Research instruments included the foot care program intervention and the questionnaire on foot care behavior. The details of the two instruments are as follows.

1) Foot care program intervention

In this study, foot care was defined as the program modeled after the Ministry of Public Health's recommended activities for foot care to prevent complications in diabetes patients. These foot care activities were appropriate for the patient's lifestyle and had the evaluation after the program. This foot care program was applied from the Orem's concept

of self-concept of which the process could be divided in two steps of evaluation and decision making which needs situation information, a thorough consideration and options for change. Later on, once the action was taken, the evaluation of the action were carried out. Goals were set forth for the decisions made and the evaluation on the action.

Activities of the foot care program were organized as group activities as follows. There were three group activity sessions and home-based individual patient's activities practice. In the first group activity session, group members considered and decided together on choosing care foot methods suitable for them. These could be done by the education on knowledge and essence of foot care provided by the researcher. Actual patients with a successful foot care to prevent complications were invited to the session as an example to encourage the practice. Experiences, obstacles, and suggestions about foot care were encouraged for discussions and exchanges. Solutions to such obstacles were selected by the group members. Foot care maneuver was then demonstrated and trained. The feet were washed in the water bucket with soap, rinsed, dried up with soft dry towel, and applied with lotion for moisture. This session took about two hours.

In the second session, foot care practice was reviewed by the researcher for sustainability. After each of all individual patients was asked to show their foot care to their group members, pitfalls and suggestions were exchanged. In this session, physical examination for foot abnormalities or defects was demonstrated and trained. Foot exercise was also demonstrated and trained. Finally, the patients were advised and trained on how to record their home-based foot care in the diary. This session also took about two hours to complete.

For the third session, the competition on healthy foot among the participants was held to motivate and encourage the foot care. Public health officers and village health volunteers were asked to participate in judging foot health of the participants. After rewarding, foot care, foot examination and foot exercise were reviewed and the problems, if any, were corrected.

2) Questionnaire on foot care behavior

Foot care behavior was defined actions or practices the patients performed to take care of their feet to maintain the health and avoid foot ulcers. These included daily washing and examining the feet, drying the feet, applying a thin layer of cream or lotion on the feet (but not in between the toes),

proper trimming the toe nails to the shape of the end of the toes, putting socks when wearing shoes, not walking with bare feet, and feet exercise, etc.

This foot care behavior questionnaire consisted of two parts. The first part asked about demographic information of the patient. The second part contained 31 questions asking about foot care behavior with a 5-point Likert-type rating scale from 5-the highest to 1-the least with a total score of 31 to 155. Scores were reversed for questions with negative statement. With the total score of 155 points, levels of foot care behavior could be categorized as the following: 131 – 155 points as the highest level of the behavior, 106 – 130 points as the high level, 81 – 105 points for the moderate level, 56 – 80 points for the less level, and 31 – 55 points for the lowest level of the behavior, of the behavior.

This questionnaire was tested for content validity by three experts of one nursing instructor and two public health instructors. A high overall item-objective congruence index (IOC) of 0.98 was obtained. For internal consistency reliability, the questionnaire was tested with a sample 30 individuals comparable to the prospective participants and a high level of reliability was found with a Cronbach's alpha coefficient of 0.84.

Foot care program schedule and data collection

At the beginning of the study, participants in the control group were asked to complete the questionnaire on demographic information and the foot care behavior. At the 12 weeks, they were asked to return for the final questionnaire completion at their regular scheduled visit at the Bansuan Sub-district Health-Promoting Hospital.

In the experimental group, participants completed the questionnaire at the beginning like those in control group. They were asked to attend three foot care practice sessions. The first session was held at the Bansuan Sub-district Health-Promoting Hospital one week from the the screening. The second session took place one week after the first one. The third session was held 12 weeks after the beginning. Each session took about two hours to complete. The participants were expected to practice foot care at home.

For the private home-based foot care practice of individual patients, they were followed up by the researcher / instructor? By three home visits and three phone calls, for 10 – 20 minutes per visit. These visits and phone calls were conducted two weeks after the third sessions to stimulate and encourage

foot care practice, and provide recommendations to solve problems or overcome obstacles. The participants were asked to complete the questionnaire at 12 weeks.

Participant right protection

This study protocol was approved by the Ethics Committee of the Regional Research Network issued by Naresuan University (Approval number 030/61; Approval date: January 21, 2019). The researcher protected the participant's right of the participant by providing objective and procedure of the study in detail to the participant. Once written informed - * consent was signed voluntarily by the participant, the research was processed. All participant's data were secured and presented as summarized sample information not the information of individual participants.

Statistical analysis

Demographic data were presented as descriptive statistics including frequency with percentage and mean with standard deviation. Paired t-test or Wilcoxon signed rank test was used to compare within-group two groups. Difference between the experimental and control groups after the program completion was tested using independent t-test or Mann-Whitney U test, as appropriate for continuous variables, and Chi-squared test or Fisher's exact test, as appropriate, for categorical variables. Significance level for all statistical tests were set at a Type I error of 5% (i.e., P -value < 0.05).

Results

Most participants in the experimental and control groups were women (80.00% and 86.70%, respectively) (Table 1). The majority were 70 years or older (43.30% in both groups). While the majority of participants in the experimental group were widowed, divorced or separated (43.30%); those in control group were married (50.00%). Most of them had a primary school education (90.00% and 86.70%, respectively). About half of them were not working (50.00 and 56.70%, respectively). About two-thirds had been diagnosed with diabetes for 1 – 9 years (63.30% and 70.00%, respectively). Most of them had never had foot ulcer (80.00% and 70.00%, respectively); and at present almost all of them did not have foot ulcer (90.00% and 93.30%, respectively). There were no statistically significant differences regarding any of these characteristics and health status (Table 1).

Table 1 Demographic and clinical status of the participants (N = 60)*.

Characteristics	Experimental group (n = 30)		Control group (n = 30)	
	N	%	N	%
Gender				
Men	6	20.00	4	13.30
Women	24	80.00	26	86.70
Age (yrs)				
40 – 49	1	3.30	2	6.70
50 – 59	4	13.20	5	16.70
60 – 69	12	39.90	10	33.30
70 or higher	13	43.30	13	43.30
Marital status				
Single	4	13.30	4	13.30
Married	13	43.30	15	50.00
Widowed, divorced, separated	13	43.30	11	36.70
Education level				
No formal education	1	3.30	3	10.00
Primary school	27	90.00	26	86.70
High school or higher	2	6.60	1	3.30
Occupation				
Not working	15	50.00	17	56.70
Agriculture	3	10.00	5	16.70
General purpose labor	6	20.00	5	16.70
Small business	6	20.00	3	10.00
Duration of diabetes (yrs)				
1 – 9	19	63.30	21	70.0
10 - 19	8	26.60	6	20.0
20 or higher	2	9.90	3	10.0
Having had any foot ulcer				
Yes	6	20.00	9	30.00
No	24	80.00	21	70.00
Having foot ulcer at the present				
Yes	3	10.00	2	6.70
No	27	90.00	28	93.30

* Chi-squared test showed no statistically significant differences between groups.

Foot care behaviors after the completion of the program

In terms of individual behaviors, participants in control groups scored highest on question number 1 (Examining feet for swelling and redness, rash, on clear blisters on the feet, and white scales or flakes between the toes) (4.60 points), followed by number 21 (Wearing soft and fit shoes to help improve blood circulation in the feet) (4.50 points) and number 2 (Washing feet with water and mild soap twice a day in the morning and evening and immediately after the feet getting dirty) (4.47 points) (Table 2). On the other hand, item number 23 (Wearing socks or stockings that are tight or compressing) had the lowest score (1.60 points).

Participants in the control group scored the lowest on question number 3 (Drying the feet with soft clean dry cloth after washing especially between the toes) (3.53 points), followed by number 21 (Wearing soft and fit shoes to help improve blood circulation in the feet) (3.50 points), number 4 (Keeping the feet clean and dry especially the bridging between the toes to avoid fungal infection and white scales or

flakes) (3.47 points), and number 13 (Always trimming the lateral nail fold of the toes for esthetic reason) (3.47 points). Item with the lowest scored was number 11 (Applying medications/ herbs other than those prescribed by the physician, on your foot wound, if any) (2.10 points) (Table 2).

Table 2 Scores of foot care behaviors in the two groups after program completion (N = 60).

Foot care behaviors (31 items)	Experimental group (n = 30)		Control group (n = 30)	
	Mean	S.D.	Mean	S.D.
1. Examining feet for swelling and redness, rash, on clear blisters on the feet, and white scales or flakes between the toes.	4.60	0.72	3.07	1.25
2. Washing feet with water and mild soap twice a day in the morning and evening and immediately after the feet getting dirty.	4.47	0.68	3.33	1.37
3. Drying the feet with soft clean dry cloth after washing especially between the toes.	4.20	0.92	3.53	1.13
4. Keeping the feet clean and dry especially the bridging between the toes to avoid fungal infection and white scales or flakes.	4.10	1.39	3.47	1.07
5. Applying a thin layer of lotion on the dry skin of the feet, if any, to improve skin moisture.	3.93	0.94	3.33	1.29
6. Peeling off the scales or flakes between the toes, if any.	3.23	1.00	2.80	1.42
7. Cleaning wounds or ulcers on the feet by yourself, if any.	2.07	1.46	2.57	1.38
8. Cleaning any new wound on the feet, if any, by yourself by clean water or saline, and drying with clean soft cloth every time.	2.87	1.63	2.77	1.35
9. Consulting with physician for treatment if any corns or hardened skin on the feet.	3.30	1.05	2.70	1.23
10. Seeking foot care including wound dressing at the hospital or sub-district health promoting hospital if any wound on the feet.	4.03	0.76	2.50	1.38
11. Applying medications/ herbs other than those prescribed by the physician, on your foot wound, if any.	2.13	1.38	2.10	1.06
12. Clipping the toe nails by trimming the nails to the shape of the end of your toes.	4.23	0.81	2.67	1.34
13. Always trimming the lateral nail fold of the toes for esthetic reason.	3.23	1.04	3.47	1.33
14. Seeking care from physician if having any ingrown toenail, not extracting it with hard and sharp device.	2.93	0.74	3.23	1.47
15. Wearing socks if feeling cold in the feet at night to warm the feet.	4.03	0.71	3.10	1.44
16. Applying rubefacient balm for numbness on the feet, if any.	2.33	1.60	2.90	1.49
17. Applying talcum powder after washing and drying the feet, if you are easily sweating.	3.93	0.74	3.03	1.47
18. Soaking your feet in water with room temperature.	1.63	0.76	2.63	1.18
19. Examining the shoes both inside and outside before wearing to avoid wounds from sharp-edged objects.	4.1	0.90	3.20	1.49
20. Always wearing socks or stockings before wearing shoes.	3.97	1.06	2.83	1.39
21. Wearing soft and fit shoes to help improve blood circulation in the feet.	4.50	0.63	3.50	1.33
22. Wearing thong sandals.	2.83	1.14	3.17	1.48
23. Wearing socks or stockings that are tight or compressing.	1.60	1.00	2.43	1.33
24. Changing socks daily to avoid piling up of sources of infection.	3.87	1.22	2.60	1.45
25. Examining feet before and after exercise to see if any scratch, bruise or swelling.	3.57	0.97	2.37	1.06
26. Sitting with one leg crossed or sitting on top of the two legs with a long duration.	1.70	1.23	2.93	1.46
27. Exercising your feet about 15 – 30 minutes per day.	4.20	0.71	3.13	1.38
28. Always exercising your feet while sitting on the chair by flexing the feet up and down toward the ankle.	4.27	0.94	3.17	1.41
29. Always exercising your feet while sitting on the chair by twisting the ankle inward and outward slowly.	3.93	1.08	3.13	1.63
30. Always exercising the small muscles in your feet while sitting on the chair by using your toes to pick cloth on the floor. using your feet to exercise small muscles.	3.37	1.45	2.63	1.32
31. Always exercising your feet while sitting on the chair by raising legs, stretching knees and flexing the ankles toward the knees, and counting 1 to 6 as 1 round.	4.13	0.86	3.07	1.33

Comparisons of foot care behavior scores within each of the two groups before and after the program

Scores of foot care behavior in the experimental group increased from 93.40 ± 13.45 points (moderate level) before

the program to 107.33 ± 7.24 points (high level) after the program with a statistical significance (P -value < 0.001) (Table 3). On the other hand, the scores in control group increased slightly with no statistical significance (90.97 to 91.37 points, P -value = 0.705) (moderate level both before and after the program).

Table 3 Within-group comparisons of foot care behavior scores in each of the two groups before and after the program (N = 60).

	Mean	S.D.	t	P-value*
Experimental group				
Before the program	93.40	13.45		
After the program	107.33	7.24	-5.092	< 0.001
Control group				
Before the program	90.97	11.04		
After the program	91.37	9.33	-0.383	0.705

* Paired sample t-test.

Comparisons of foot care behavior scores between the two groups before and after the program

Before the program, scores of foot care behavior in the experimental and control groups were comparable (93.40 to 90.97 points, P -value = 0.447) (Table 4). However, after the program, score of foot care behavior in the experimental group (107.33 points) was significantly higher than that in control group (91.37 points) (P -value < 0.001).

Table 4 Comparisons of foot care behavior scores between the two groups at before and after the program (N = 60).

	Mean	S.D.	t	P-value*
Before the program				
Experimental group	93.40	13.45		
Control group	90.97	11.04	0.766	0.447
After the program				
Experimental group	107.33	7.24		
Control group	91.37	9.33	7.401	< 0.001

* Independent sample t-test.

Discussions and Conclusion

Foot care program could improve foot care behavior significantly both the average scores and the level of the behavior (from moderate to high level). On the other hand, scores in participants with no program remained at the moderate level from before to after the program period. The

finding in this study was consistent with the study at Lanska Hospital where a program to promote self-care behavior and HbA1C in type 2 diabetes patients was tested and a significant improvement in self-care behavior score when compared with control group was found (P -value = 0.001).¹⁵

With a significance in improvement in foot care behavior in the experimental group, behavior number 1 (Examining feet for swelling and redness, rash, on clear blisters on the feet, and white scales or flakes between the toes) was found to be improved with the highest score. This significant improvement could be due to the open shared experience among participants, either successful or not, was allowed. Recommendations for problems and obstacles, as well knowledge, were provided. In addition, role model of foot care could also play a crucial role in motivating the participants. All participants were also encouraged to participate in discussions, analysis, realization and decision making. Therefore, behavior modification suitable to daily living of each of the individual participants could be done. The practice of foot care behavior could be carried out easily.¹⁷ With a more control on factors contributing to foot ulcer, patients in our study could modify their foot care behavior and footwear better which was consistent with the study of Fan et al.¹⁸

With a significantly higher score of foot care behavior in the experimental group compared with the control group, could be due to participants undergoing the program took part in planning behavioral change and modifying accordingly. They took charge in or were accountable for the change in their self-care to maintain their health and wellness.¹⁶ According to self-care concept of Orem et al., self-care is an action with intention and goals.¹⁶ Self-care process consists of consideration, decision making leading to specific actions, and evaluation of the outcomes against the set goals. To succeed in self-care, one needs to acquire knowledge, understanding and realization on the actions as appropriate and effective for reaching the goals. This was consistent with the study at Lanska Hospital where self-care behavior score increased significantly when compared with control group (P -value < 0.001).¹⁵ It was also consistent with the study to examine benefits of a program to promote behavior to prevent foot complications in diabetes patients at Don-kwang sub-district health promoting hospital, Muang district, Nakhonpanom province.¹⁴ They found that patients receiving the program had a significantly higher score of diabetes knowledge, health belief perception on complication

prevention behavior, and the actual behavior to prevent food complications when compared with baseline and with those in the control group (P -value < 0.01).

Program activities could also encourage a continuous foot care behavior. This was consistent with the study to promote foot care in diabetes patients at Srapanglan sub-district, Uthong district, Suphanburi province.¹⁴ After the program, the participants had a significantly higher scores of knowledge, foot care, perceived foot complication risk, perceived severity of foot ulcer, perceived benefits of foot complication prevention, and foot care behavior when compared with those before the program (P -value < 0.05).¹⁴

This present study was also consistent with the study in Chonburi province where they found that after the program of support and knowledge provision, patients undertaking the program had a significantly higher level of foot care behavior when compared with baseline and with the control group (P -value < 0.01).²⁰

Based on the findings of this present study, healthcare settings at all levels could have their diabetes patients benefit from the program to prevent foot complications. Since the program was not complicate, implementation of the program in various settings could be readily feasible. However, healthcare providers to continuously encourage the patients for home foot care should be readily available. More issues could be explored to further improve the program especially the program continuity.

This study had a limitation. Since, self-care on the foot required some dexterity, the elderly diabetes patients or those with a limited ability for daily living could face some difficulties in this foot self-care. The patients might need relatives, family members or other caregivers for this foot care.

In terms of future research, studies in a broader regions and healthcare settings are needed for a better generalization. In addition, studies with longer durations should be conducted to prove a long-term and continuous sustainability of the foot care program.

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