

## GENERAL ARTICLE

# Community participation in health care services for Type 2 Diabetes Mellitus patients: A case study of a sub-district health promoting hospital in Northeast Thailand.

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### Abstract

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The main purpose of this action research was to evaluate the effects of Appreciation Influence and Control (AIC) technique in improving knowledge and practices of type 2 diabetes mellitus patients, improving health care services, and active community participation at a sub-district health promoting hospital (SDDPH) in Northeast Thailand. The research was divided into three phases. Firstly, the pre-research phase where the researchers studied and described the important information, relevant diabetes situation or community context. Secondly, it was on research phase where the A-I-C technique was applied to employ on participants to determine the problems and how to solve the problem. It included the following 3 steps: 1) presentation of current problems and setting desired goals for future, 2) searching appropriate activities, prioritization of the activities, and job assignment, 3) conducting activity plans and evaluation of the results from the action. Thirdly, it was on summative evaluation phase. The purposive sampling technique was used to select all 71 participants who were willing to participate in the study. A total of 71 participants consisted of 40 type 2 diabetes mellitus patients, 10 caregivers, 10 village health volunteers, 6 community leaders and 5 health personnel. Qualitative and quantitative methods were used to collect and analyze the data. There were three kinds of instruments used in this study. This included the questionnaire, focus group discussion guidelines, and observation checklist for investigation of the change on knowledge, patients' practices, and community members' participation. All three instruments were approved for content validity by three experts. The questionnaire reliability using Cronbach's alpha coefficient was 0.79. Paired t-test was utilized to compare the differences between the diabetes mellitus patients' knowledge and practices before and after the development. In addition, content analysis was applied to present the qualitative data by compiling keywords and relating reasonableness.

Results revealed that both diabetes knowledge and practices of type 2 diabetes mellitus patients have a significant difference between before and after the AIC technique approach. The effects of Appreciation Influence Control (AIC) technique led the gathering participants perceived and was aware of their diabetes problems. They have the opportunity to express their views and make developing activities for improving health care services for type 2 diabetes mellitus patients. They participated improving health care services according to their perspectives and having satisfaction in their cooperating outcomes.

It is notable that the process of AIC technique gathered the people concerned diabetes problem to situation analysis, decision-making, planning, and program implementation. It was appropriate tool for development of community participation to improving health care services for type 2 diabetes mellitus patients.

**Keywords:** Community participation, type 2 diabetes mellitus patients, AIC technique

# การมีส่วนร่วมของชุมชนในการดูแลผู้ป่วยเบาหวาน ชนิดที่ 2 : กรณีศึกษาโรงพยาบาลส่งเสริมสุขภาพตำบล แห่งหนึ่ง ในภาคตะวันออกเฉียงเหนือ ประเทศไทย

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## บทคัดย่อ

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การมีส่วนร่วมของชุมชนในการดูแลผู้ป่วยเบาหวานชนิดที่ 2: กรณีศึกษาโรงพยาบาลส่งเสริมสุขภาพตำบลแห่งหนึ่ง ในภาคตะวันออกเฉียงเหนือ ประเทศไทย ว.สารสนเทศและการพัฒนา. 2560;15(2):69-85

การวิจัยเชิงปฏิบัติการครั้งนี้มีวัตถุประสงค์เพื่อศึกษาผลของการใช้เทคนิคการวางแผนแบบมีส่วนร่วม (Appreciation Influence Control: AIC) ใน การพัฒนาความรู้ การปฏิบัติของผู้ป่วยโรคเบาหวานชนิดที่ 2 การพัฒนาบริการสุขภาพ และการมีส่วนร่วมของชุมชน โรงพยาบาลส่งเสริมสุขภาพตำบลแห่งหนึ่งในภาคตะวันออกเฉียงเหนือ การวิจัยแบ่งออกเป็น 3 ระยะ คือ ระยะแรก เป็นช่วงก่อนการวิจัย เป็นระยะของการศึกษาข้อมูล สถานการณ์ และบริบทของชุมชน ระยะที่สอง เป็นระยะการวิจัย ในระยะนี้ เป็นการประยุกต์ใช้กระบวนการวางแผนแบบมีส่วนร่วม (AIC) มีการระดมสมอง เพื่อ การแลกเปลี่ยนความคิดเห็น นำเสนอข้อมูล การค้นหาแนวทางแก้ไขปัญหาและทำแผนการจัดการปัญหา ในระยะนี้มี 3 ขั้นตอน (ดังนี้ 1) การร่วมกันนำเสนอปัญหาที่เกิดขึ้นในปัจจุบันและกำหนดเป้าหมายที่ต้องการในอนาคต 2) การค้นหาวิธีการแก้ไขปัญหา การจัดทำแผนงาน กิจกรรมแก้ไขปัญหา และการมอบหมายความรับผิดชอบ 3) การดำเนินงานตามแผนงานที่จัดทำขึ้นร่วมกัน ระยะที่ สาม เป็นระยะสรุปและการประเมินผลการวิจัย การคัดเลือกกลุ่มเป้าหมายเป็นแบบเจาะจง และเป็นผู้อินดีและเติมใจเข้าร่วมโครงการวิจัย จำนวน 71 คนประกอบด้วยผู้ป่วยเบาหวานชนิดที่ 2 จำนวน 40 คน ผู้ดูแลผู้ป่วย จำนวน 10 คน อาสาสมัครสารสนเทศสุขประจามุ่นบ้าน จำนวน 10 คน ผู้นำชุมชน จำนวน 6 คน และบุคลากรสุขภาพ จำนวน 5 คน เก็บรวบรวมข้อมูลโดยใช้เครื่องมือ 3 ชนิดประกอบด้วย 1) แบบสอบถาม (2) แนวทางการสนับสนุนกลุ่มและ 3) แบบบันทึกการสังเกตการมีส่วนร่วม เครื่องมือทั้งหมดได้ผ่านการตรวจสอบจากผู้เชี่ยวชาญ 3 ท่าน สำหรับแบบสอบถามได้ตรวจสอบความเชื่อมั่นโดยใช้เครื่องมือ Cronbach's alpha coefficient ได้เท่ากับ 0.79 การวิเคราะห์ข้อมูลใช้สถิติอ้างอิง คือ Pair t-test เพื่อเปรียบเทียบความแตกต่างของค่าเฉลี่ยคะแนนความรู้และการปฏิบัติตัวของผู้ป่วยเบาหวานก่อนและหลังการพัฒนา สำหรับข้อมูลเชิงคุณภาพใช้การวิเคราะห์เชิงเนื้อหา (Content Analysis) โดยประมาณคำสำคัญและเชื่อมโยงความเป็นเหตุเป็นผล

ผลการวิจัย พบว่า ความรู้และการปฏิบัติของผู้ป่วยเบาหวานชนิดที่ 2 ก่อนและหลังดำเนินการ มีความแตกต่างกันอย่างมีนัยสำคัญทางสถิติ การใช้เทคนิคการวางแผนแบบมีส่วนร่วม (AIC) ทำให้คนในชุมชนมีโอกาสได้แสดงความคิดเห็นและมุ่นมอง ต่อปัญหาโรคเบาหวาน และมีส่วนร่วมในการกำหนดแนวทางพัฒนาระบบบริการดูแลผู้ป่วยโรคเบาหวานรวมทั้งมีความพึงพอใจในผลลัพธ์ที่ได้จากการทำงานร่วมกัน

สรุปผลการวิจัย กระบวนการของ AIC ได้รับความนิยมอย่างสูงในชุมชน ทำให้คนในชุมชนมีโอกาสได้แสดงความคิดเห็นและมุ่นมอง ต่อปัญหาโรคเบาหวาน และมีส่วนร่วมในการกำหนดแนวทางพัฒนาระบบบริการดูแลผู้ป่วยโรคเบาหวานรวมทั้งมีความพึงพอใจในผลลัพธ์ที่ได้จากการทำงานร่วมกัน

**คำสำคัญ:** การมีส่วนร่วมของชุมชน, ผู้ป่วยเบาหวานชนิดที่ 2, เทคนิคการวางแผนแบบมีส่วนร่วม (AIC)

## Introduction

Currently, diabetes mellitus is a chronic illness that has been shown an increasing number of patients likely to occur each year, especially type 2 diabetes mellitus patients. According to the global estimation, the number of diabetes mellitus patients are expected to increase from 171 million (2.8%) in year 2000 to 366 million (4.4%) in year 2030.<sup>1</sup> Thailand is ranked fourth in DM prevalence in the South-East Asia Region and had 1,536,000 DM patients in 2000. The WHO had projected 2,739,000 diabetics by 2030.<sup>2</sup> Diabetes patients were found to experience complications and have impacts on their daily life. As a result, these patients have to undergo treatment in a longer period compared to others and most of them could not control their blood glucose or glycaemic level and fail to predict their own health condition.<sup>3</sup> Moreover type 2 diabetes mellitus patients are considered as a financial burden of themselves, their families as well as the nation.<sup>4</sup> Previous studies showed evidences that type 2 diabetes mellitus patients who have undergone the health program, encouraged in such awareness and useful information or received right knowledge of the key facts play an important role in promoting patients to have proper behaviour. They showed better level of both blood sugar and blood pressure.<sup>5-8</sup> Type 2 diabetes mellitus patients often lack the knowledge and skills to self-manage their condition. Lacking of knowledge of diabetes care among patients can have adverse effects on their capabilities to control diabetes.<sup>9,10</sup> The key element to promote the quality care for type 2 diabetes mellitus patients in Sub-District Health Promoting Hospital (SDHPH) is to encourage the patients to have the right diabetes knowledge attitude and appropriate health practices.

To achieve this, patients are required to be aware of seven key facts of the illness namely: basic knowledge of diabetes, dietary control, exercise, diabetes treatment, personal hygiene care, mental health care, and prevention of complications.<sup>11</sup> The process of caring diabetes patients requires integrated participation from various parties including the diabetes patients themselves, family members, village health volunteers (VHVs), and community leaders who are supposed to work together with health care personnel at primary health care level.<sup>12</sup> Their community participation in the entire process is important which includes determining problems and causes of such problems, planning, processing, evaluating, gaining benefits and having responsibilities.<sup>13,14</sup> There are many factors influencing and supporting diabetes patients to better improve their health behaviour as social ecological framework (SEF).<sup>15</sup> Diabetics are influenced by the community context both direct and indirect ways. In terms of the SEF, sources of supporting for diabetes related behaviour including the individuals type 2 diabetes mellitus patients, health care system, local religion and culture interpersonal support, e.g. family members and friends, healthcare professionals, community members, community organizations, colleagues in the workplace, health care services, and the medias. So, related community participation and community supports are the key for successful health care services for diabetics.

A community with ample resources and potential for enhancing self-management of type 2 diabetes mellitus patients can provide support that is consistent with the patient caring plan. This consequently leads to an instance that the patients have proper behaviour and show better blood sugar control.<sup>16-18</sup>

Community participation is the main principle of public health care and health promotion. It can serve as a “bridge” between health care providers and community members, especially in rural areas.<sup>19</sup> It should be the process to get a way for improving health care services in SDPHPs and supports type 2 diabetes mellitus patients to maintain health behaviors, lead to have adequate diabetes knowledge and perceptions, increase self-efficacy and improving self-care management behavior as well. Patient contributions, notably, are very important for better management of diabetes.

Appreciation Influence Control (AIC) is the strategy used to create partnerships among stakeholders who affected by the issues. It was designed as an alternative to “top-down planning”. There are 3 main steps that define AIC. The first step is, “appreciate through listening”. Health personnel appreciate the realities and possibilities of the situation to gain perspectives on the stakeholders and community situation. The second step, “influence through dialogue”. The logical and strategic options for action are explored and selected like value strategies. The last step is “control through action”. This step enables the stakeholders to take responsibility for choosing a course of action freely, based on information brought to light through workshops and activities. Therefore, AIC technique is a process to approach community participation in which individuals involved in the diabetes care in SDPHP participate in caring for diabetes patients. It is comprised of determining problems and the causes of such problems, planning solutions, and solving.<sup>20</sup> The AIC technique is defined as learning process and an action gathering that offers every related individuals to have an opportunity

to share their opinions, information, knowledge, and experience. So that the participants can reach the understanding of the problems, needs, limitations, and potential. This gathering can lead to cooperative acceptance and decisions to multilaterally develop and solve any problems regarding diabetes care. AIC technique is applied through three main steps namely: raising knowledge (Appreciation: A), creating a developing process (Influence: I), and creating an action process (Control: C). AIC technique for improving quality care may reduce health problems both uncontrolled glycaemic level and diabetes complication in type 2 diabetes mellitus patients that yield long term benefit.

According to the problem statements aforementioned, the researchers are interested to study the quality care of type 2 diabetes mellitus patients in SDPHP with the purpose of evaluating the effects of Appreciation Influence and Control (AIC) technique in improving knowledge and practices of type 2 diabetes mellitus patients, improving health care services, and active community participation.

## Methods

Researchers applied the action research method to investigate how AIC would improve knowledge and practices of type 2 diabetes mellitus patients as well as promoting community participation for care within a 5-month period (1st August to 31<sup>th</sup> December 2014) in A Sub-district Health Promoting Hospital Northeast Thailand. The purposive sampling technique was used for selection of all participants who are willing to participate in the study. The participants were 71 voluntary individuals that consisted of 40 diabetes mellitus type 2 patients, 10 care givers, 10

village health volunteers, 2 village leaders, 2 village assistant leaders, 2 members of local administrative organization, 5 health personnel (3 from SDHPHs and 2 from Community Hospital). All of health personnel were involved or responded to care type 2 diabetes mellitus patients at the area of study. This research comprised of 3 phases as followed:

**Pre-research phase** (1<sup>st</sup> August – 31<sup>th</sup> August, 2014). This was the period of research preparation for the area of study and seeking for the important information or community context. The qualitative data like base line data of community, key informant approach and relevance diabetes situation was taken into account.

**Research phase** (1<sup>st</sup> September - 30<sup>th</sup> November, 2014), The A-I-C technique was applied to employ on participants to determine the problems and how to solve the problem of type 2 diabetes mellitus. The pre and post testing of diabetes knowledge and practices of the patients were also carried out. There were 3 steps in research phase; 1) Appreciation (A) step. This step is the presentation of current problems and setting desired goals for the future. It involves a cooperative planning gathering, participants and researchers attempted to search, discuss and share their opinions and data until they obtained the best saturated data. The main content of the gathering was previous basic information and the existing circumstances before the development. All participants have undergone workshop for brainstorming, sharing and raising diabetes knowledge, presentation of current problems, setting desired goals for future. 2) Influence (I) step. This step concerns about searching appropriate activities, prioritizing of

activities, and job assignment. All participants and researchers then continuously brainstorm to create action processes that will be applied to the solutions derived from the first step and improve such solutions for actual practices by conducting activity plans or projects to improve type 2 diabetes mellitus care process, then, prioritization of the activities, job assignment, and creating an action process to improve the quality care. 3) Control (C) step. This third step focuses on conducting activity plans and evaluation of the results from the action. It is an evaluation of the results from the action, participation of all participants as well as post-testing diabetes knowledge and practices of diabetes patients.

**Summative evaluation phase** (1<sup>st</sup> December-31<sup>th</sup> December, 2014), this phase is an evaluation period after the project has been done. This phase took place in 3 months after the action gathering. The summative evaluation included the assessment of diabetes care support from caregivers, VHV, community leaders, and health personnel at a SDHPH and Community Hospital. The comparison between diabetes mellitus patients' knowledge and practices, the comparison of community participation in type 2 diabetes mellitus care before and after the development.

The researchers utilized mixed method to collect data. Research instruments used in this study were questionnaire, focus group discussion guideline, and observation checklist during the participation process. These three instruments were then sent to a panel of 3 experts to comment, and make some modifications to certify the validity of the content. The reliability of the questionnaire which was analysed through Cronbach's alpha coefficient was 0.79.

Focus group discussion guidelines and observation checklist were used to collect qualitative data like community context, participation of caregivers VHVs community leaders and health personnel in all 3 research phases. All participants were observed in each of the research phases to compiled participatory data. Most participants joined the AIC procedure one cycle in research phase and some representative key informants were purposively selected to join the focus group discussion at least four times in all research phases.

The questionnaire consisted of diabetes patients' knowledge and practice contents. Diabetes patients' knowledge regarding the type 2 diabetes included 7 aspects in 35 questions with a total of 35 scores. The interpretation of average scores were based on the following:

High level means 80 percent of correct answers and higher

Medium level means 60-79 percent of correct answers

Low level means under 60 percent of correct answers

Diabetes patients' practices include 6 aspects in 40 questions with a total of 120 scores. The questionnaire was formed as a rating scale platform. There were categorized into 3 scales: good, fair and poor as follow:

Practices	Interpretation	Positive statement	Negative statement
Regular practices	good	3	1
Occasional practices	fair	2	2
No practices	poor	1	3

Note Regular practices means practicing 4-7 days per week  
Occasional practices means practicing 1-3 days per week  
No practices means not practicing during the weeks

The interpretation applied criterion-referenced scores (Bloom, 1968) as follow:

- Good or Regular practices means 80 percent of scores and higher
- Fair or Occasional practices means 60-79 percent of scores
- Poor or No practices means under 60 percent of scores

After data normality was tested, paired t-test was utilized to compare the difference between the diabetes mellitus patients' knowledge and practices score before and after the development. In addition, content analysis was applied to present the qualitative data by compiling keywords and relating reasonableness depending on the problems found from the quantitative data.

There are some limitations in this action research due to a short period of the study such as: the number of sample population maintained the same before and after the assessment procedure; continuity of project activity, and awareness of participants to communicate and promote the diabetes prevention to other villagers. The Research ethics of the study was certified by the Office of The Khon Kaen University Ethics Committee in human research on 26 September 2014. (Order 4.4.02: 28/2557 No.HE572166)

## Results

### 1. Demographic Profile of the type 2 diabetes mellitus patients

Descriptive statistics were calculated for patient characteristics, among 40 type 2 diabetes mellitus patients, thirty four patients were females (73.6%).

Most of the them, (45.0%) were sixty years old and older With an S.D of 90.40. The youngest age was forty one year old while the oldest age was eighty year old. Twenty-nine patients were married (72.5%). Thirty nine patients were found to have graduated from a elementary school (97.5%), while twenty seven patients were agriculturists (67.5%). The average income per month was 3,915 Thai baht per month (S.D. = 3259.35)while the lowest and the highest income per month were 500 Thai baht and 20,000 Thai baht, respectively. Nineteen patients (47.5%) have an average of 3 to 5 family members while twenty two patients (55%) played a role of family members. 31 patients (77.5%) had a Universal Health Care Coverage as their right to health access.

In terms of the condition of the patients' illness, it was found that most of the type 2 diabetes mellitus patients (26 persons or 65.0%) had been suffering from the illness for longer than 5 years with an average duration of 9.53 years (Median = 7 .41, S.D. = 6.83). Twenty five of the patients (62.5%) had relatives who also developed diabetes. Six persons (15%) were found to have complications, while eleven patients (27.5%) experienced high blood pressure. Twenty five of the patients (62.5%) received treatment at Community Hospital(CH). Over the 6 months' period, the majority of the patients (33 persons or 82.5%) always keep on responding to their medical appointments. Thirty five of the diabetes patients (87.5%) were treated by oral drugs. Fasting Blood Sugar (FBS) over six months before participating in the study of most patients was poor (higher than 140 milligrams per decilitre), while their FBS in the latest measurement right before the participation was mostly fair (121-140 milligrams per

decilitre). Nineteen patients (47.5%) showed normal figures of Body Mass Index (BMI), while ten of the entire patients (25.0%) were in obesity.

## **2. Community participation in caring for type 2 diabetes mellitus patients before the development**

The primary diabetes care services provided by SDPH is a holistic health care that covers primary treatment, health promotion, disease prevention and control, rehabilitation, and Thai traditional medicine. In addition, the hospital offers these services to reduce any health risk at all levels from individuals, family and community level. When diabetes mellitus patients with complications or unable to control blood glucose were detected, they were transferred to Community Hospital where secondary health care is provided. The cooperation between SDPH and Community Hospital was not completed especially in terms of clinical information and knowledge and practice lacking to patients. The main emphasis of the diabetes care is placed on a proactive work done by multidisciplinary team accompanied with registered nurses as a case managers. Chronic Care Model (CCM) has been employed as a leading method for the action plan of district health service network. CCM was developed to improve care of diabetes mellitus patients at SDPH which describes six characteristics of diabetes care services. The 6 characteristics of CCM are organizational support, self-management support, delivery system design, decision support, clinical information systems, and community linkages. Some elements like self-management support, delivery system design, clinical information systems and community linkages were not fully implemented in this SDPH. The findings from the analysis on

basic information and the existing circumstances for further development are presented:

### **(a) Diabetes health care services support**

Several limitations and weaknesses were found in the health care service. For example, the regulations did not effectively contribute to successful diabetes care. Additionally, there were limitations on information management, doctors' participation in improving consistent practice guidelines, design of detailed service for diabetes mellitus patients with complications, estimate of patients' needs for self-caring and cooperation in community. Further limitations and weaknesses also included plan for enhancing service quality, application of community process. Moreover, personnel turnover effected to continuity of working led to poor information management and participation concerned.

### **(b) Community participation in determining problems and solutions regarding diabetes care**

It was found that majority of residents in community took part in activities and events organized by SDPHs, such as the diabetes screening campaign, exercise campaign, and participation in arranging space for such activities and encouraging diabetes mellitus patients to join the events. However, this participation was mostly taken on request, which means the target group was given health service from time to time. As a consequence, there was lack of opinion sharing, problem proposing, and needs for service improvement for specific requirement. Furthermore, participation process between the involved stakeholders was not continuously developed as we expected.

### **(c) Knowledge and practices of type 2 diabetes mellitus patients**

Most of the type 2 diabetes mellitus patients had incorrect diabetes knowledge about the disease,

dietary control, healthy exercise, proper diabetes treatment, personal hygiene, mental health care like stress control, and prevention of complications like wound prevention. In terms of behavior, majority of type 2 diabetes mellitus patients had improper behavior due to several reasons including their family members' readiness to provide food and being busy with their own routine work. Most patients were lacking of correct understanding regarding healthy exercise, and some consume juice that was claimed to be beneficial to health by the local radio. With regard to mental health, many patients were worried and stressed about their family members' behavior and family expenses.

### **3. Guidelines of community participation in health care services for type 2 diabetes mellitus patients**

Relevant individuals took place in the AIC gathering in order to develop a plan for suitable diabetes care. The result of the gathering can respond to diabetes care problems and needs, and it is consistent to community ways. The guidelines of community participation for improving for quality care of type 2 diabetes mellitus patients are as follows:

- (a) Type 1 project is a project that can be processed by community members themselves. It consists of the association of community diabetes patients and praying and practicing the dharma for mental health improvement.

- (b) Type 2 project involves any project that is processed by community in collaboration with other local organizations. Examples of such are project of community diabetes care development and the project to improve diabetes patients' self-efficacy, proper diabetes knowledge and behavior.
- (c) Type 3 project means any project that has to be processed by external organizations. This includes the project of improving the sport square for diabetes mellitus patients.

### **4. Change of type 2 diabetes mellitus patients' knowledge before and after the AIC development**

The mean scores of diabetes knowledge of type 2 diabetes mellitus patients' on overall knowledge about the disease before and after AIC development showed a significant difference at significant level 0.05(p-value < 0.001). The mean score of diabetes knowledge after the AIC development ( $\bar{x} = 33.5$ ) was found to be higher as compared to before AIC development ( $\bar{x} = 28.5$ ). On top of that all the specific aspects of knowledge before and after the AIC development showed a statistically significant difference ( $p<0.001$ ) as shown in Table 1.

**Table 1** Change of diabetes patients' knowledge before and after the AIC development.

Knowledge about diabetes	$\bar{x}$	S.D.	95%CI	t	df	p
<b>1. Basic knowledge</b>						
Before the AIC development	4.4	0.71	2.001-2.592	15.959	39	<0.001
After the AIC development	6.7	0.53				
<b>2. Dietary control</b>						
Before the AIC development	4.3	0.75	0.197-0.653	3.775	39	<0.001
After the AIC development	4.7	0.52				
<b>3. Healthy Exercise</b>						
Before the AIC development	4.2	0.80	0.296-0.754	4.640	39	<0.001
After the AIC development	4.8	0.54				
<b>4. Diabetes treatment</b>						
Before the AIC development	4.5	1.15	0.080-0.520	2.762	39	0.009
After the AIC development	4.8	0.54				
<b>5. Personal health care</b>						
Before the AIC development	3.7	0.83	0.018-0.232	2.360	39	0.023
After the AIC development	3.8	0.53				
<b>6. Mental health care</b>						
Before the AIC development	3.9	0.36	0.003-0.197	2.082	39	0.044
After the AIC development	4.0	0.22				
<b>7. Prevention of complications</b>						
Before the AIC development	3.6	0.59	1.120-1.480	14.581	39	<0.001
After the AIC development	4.9	0.267				
<b>8. Overall knowledge</b>						
Before the AIC development	28.5	3.70	4.398-5.752	15.162	39	<0.001
After the AIC development	33.5	2.21				

**5. Change of type 2 diabetes mellitus patients' practices before and after the development**

The mean scores of diabetes practices of type 2 diabetes mellitus patients' on overall practices about the disease before and after AIC development showed a significant difference at significant level 0.05 (p-value

< 0.001). The mean score of diabetes practices after the AIC development ( $\bar{x} = 110.0$ ) found to be higher compared to before AIC development ( $\bar{x} = 98.4$ ). On top of that all the specific aspects of practices before and after the AIC development showed a statistically significant difference ( $p < 0.001$ ) as shown in Table 2.

**Table 2** Change of type 2 diabetes mellitus patients' practices before and after the AIC development.

Diabetes patients' practices	$\bar{x}$	S.D.	95%CI	t	df	p
<b>1. Dietary control</b>						
Before the AIC development	18.7	2.02	1.110-1.890	7.779	39	<0.001
After the AIC development	20.2	1.89				
<b>2. Healthy Exercise</b>						
Before the AIC development	14.5	2.03	1.011-1.939	6.434	39	<0.001
After the AIC development	16.0	1.25				
<b>3. Diabetes treatment</b>						
Before the AIC development	21.5	1.74	0.395-1.155	4.128	39	<0.001
After the AIC development	22.2	1.12				
<b>4. Personal health care</b>						
Before the AIC development	12.3	2.01	0.463-1.037	5.278	39	<0.001
After the AIC development	13.1	1.40				
<b>5. Mental health care</b>						
Before the AIC development	16.9	2.40	0.894-1.906	5.597	39	<0.001
After the AIC development	18.3	1.63				
<b>6. Prevention of complications</b>						
Before the AIC development	14.6	1.48	1.676-2.474	10.513	39	<0.001
After the AIC development	16.7	0.80				
<b>7. Overall diabetes practices</b>						
Before the AIC development	98.4	7.40	10.381-12.769	19.605	39	<0.001
After the AIC development	110.0	5.83				

## 6. Community participation in type 2 diabetes mellitus patients' care before and after the development

### Caregivers

In terms of the caregivers' awareness on the diabetes circumstances, they realized that the number of diabetics is increasing each year and also increasing in young group. The diabetics suffer considerably since they need to take medicines regularly, experience with long time of waiting at the hospital, and avoid

any activities as well as hard work that might cause wounds. Considering the awareness of the roles, the caregivers were mainly responsible for bringing the patients to and from the hospitals, yet they somehow thought that they spent too much time taking care of the patients. In relation to the needs for problem-solving and health care management of the SDPH, after participating in the study the authorities were thankful to any related individuals for caring for the patients and trying to give the patients correct information concerning adequate diet, nutrients, motivation, and

encouragement about exercise, medicine consumption, meditation, praying as well as notification about the doctoral appointments.

#### **Village health volunteers**

The health volunteers who had attended the seminar of diabetes gained better understanding that the disease is chronic disease as well as the number of diabetics is increasing at the same rate as potential patients. In terms of the roles, the volunteers were responsible for encouraging the patients to participate in events held by health personnel at SDPH, conducting a survey on potential diabetic patients and reporting to public health officials. As for the needs for problem-solving and health care management of the health promoting hospital, the volunteers wished to see members in the community become more enthusiastic about their health and diabetes by doing regular exercise with experienced guides and receiving physical examination for diabetes. They also would like the hospital to provide mobile health care service once a month so that some patients will not miss their doctoral appointment when they are not able to travel to the community hospital.

#### **Village leaders**

The leaders were aware that the number of diabetics increase because people's behaviour and lifestyle were different from the past. That is, there is a large amount of contaminated food sold in markets and restaurants. In addition, people become more convenient and tend to work less. This contributes to the overweight condition, which is a cause of diabetes. In terms of the roles, the leaders realized that the health volunteers and the public health officials

had satisfying collaboration while the leaders could participate by facilitating broadcasting activities and providing available space for the events held by the volunteers. Considering the needs for problem-solving and health care management of the health promoting hospital, the leaders wished to see members of their community free of diabetes and any other preventable diseases. They also would like to have a community sports field and individuals responsible for bringing diabetic patients to and from the hospital. Lastly, they hoped to have events for encouraging the patients to take medicines regularly, consuming good diet, and do exercise, and practice meditation.

#### **Health personnel**

The result of this study indicated that health personnel were able to create community participation by enhancing their diabetes knowledge and skills. They provided the community members opportunities to take care of diabetes mellitus patients and raise awareness concerning the danger of the disease and potential problems in the future. Besides, community members also found to be realized that it was important to pay attention to the disease within the community because each year there were an increasing number of people who were affected by this diabetes disease, such as deaths, blindness as well as chronic wound on feet.

In addition, diabetes caregivers tend to give more proper and appropriate treatment. Similarly, the patient themselves began to behave, according to health personnel's advice. To illustrate, patients were attending to every medical appointment and consumed medicine on a regular basis. The community events after exercise and practicing the dharma for stress relief were successfully held. Lastly the community

leaders also considered the importance of raising awareness regarding diabetes care. Consequently, they encouraged diabetes mellitus patients to have an appropriate and healthy way. Finally, the leaders proposed a plan to improve the “sport square” in their community for the risk groups and diabetes mellitus patients. They also cooperated with Local Administrative Organization in order to request budgets for any further related activities.

## Discussion

Findings regarding the significant difference of mean score in term of diabetes patients' knowledge and practices before and after AIC development improved as well as diabetes patients have more experiences to increase better diabetes knowledge and confidence practices. AIC technique led to fulfil the lack of relationship and creation of trust and respect between researcher, health personnel and community members as well as focus on empowerment and transferring power all of them.<sup>21</sup> Although Diabetes care management provided by SDHPHs is a primary health service that covers treatment, health promotion, disease prevention and control, and rehabilitation. These services are provided under the supervision of District Health Coordinating Committee (DHCC), an organization that supports the whole aspects of diabetes care, including personnel, budgets, instruments, materials, and management. This support has facilitated diabetes care so that it can be proceeded according to the principle of chronic disease management or Chronic Care Model (CCM), a model that health organizations have to employ in order to improve the quality of health service.<sup>22</sup> Another advantage of the support also includes ability to process an ac-

tion service by screening and detecting new diabetes patients in order to prevent and delay the development of diabetes and reduce complications.<sup>11</sup> Diabetes care at primary level is important as it is easily accessible for people. This is found to be in accordance to the results from comparative studies on primary health service in both urban and rural areas. Therefore, there were more clients in an urban area than in a rural area. Furthermore, services and health problems in both areas were different. The reasons that can explain this issue are short duration of waiting, proximity to their neighborhood and satisfaction of the service provided.<sup>23</sup> The results are also relevant to previous studies indicated that there was a relationship between the knowledge of organizations and the quality of health service<sup>18</sup> as well as the use of chronic disease management gives a long-term result of better blood sugar control and diabetes care. AIC technique made a commitment to listening to community views and giving them priority and providing resources for and facilitating community level involvement and action. In process running, the use of a range of techniques, including visual and arts-based method to ensure that participants is accessible diversity of people making up the community.

The participation among related individuals could encourage patients and caregivers to improve their ability in self-caring. This ability would help patients increase the knowledge of diabetes disease, thus, have correct behavior. This finding was found to be congruent with previous studies mentioning about the knowledge that plays a vital role in increasing ability in self-caring, and patients sustained with knowledge and information concerning proper behavior can have correct understanding of diabetes.<sup>24</sup> In addition, find-

ings of this study are also equivalent to past study on the group educating program for self-caring in the public and families with type 2 diabetes mellitus patients. The previous study found that the diabetes patients showed better levels of blood sugar and blood pressure in 6-month-time after the program. Moreover, this study conforms to the related research finding which showed that communication, education, personal factors, and support are influential on ability in self-caring among diabetes patients. Another study also revealed that the behavior scores of diabetes care in family and the scores of diabetes patients' attitude towards the disease showed a significant difference. In addition, this study is also consistent with some previous study, its findings suggested that the self-caring promoting program for diabetes patients is in accordance with constant treatment. Likewise the determining support system for diabetes care is in accordance with appropriate self-caring behavior, including blood sugar screening, dietary control, exercise, and medicine consumption.<sup>25</sup> However, these results are contradicted with the study, which they found that diabetes patients had trouble of understanding and following doctors' medical advice and they were still not consume medicine according to the given prescriptions and were not attending the medical appointments.<sup>26</sup>

Health personnel begin to consider the importance to gain participation by improving their knowledge and ability in seeking potential community for more participation. They also improve the ways to provide health education and work together with patients and assistants to be able to control blood sugar. There is an upward trend in the participation between diabetes patients, caregivers, village health volunteers, and

community leaders. This change can indicate that the analysis on diabetes in community encourages every individual to realize the significance to raise participation hence become an important tool to enhance the quality of diabetes care. The participation also optimizes personal resources and allows every related person to learn from each other so that they can determine problems and the causes of such problems. In addition, the participation in problem solving can develop diabetes care in the way that is consistent with the needs of the community. As a result, this study conforms with the participating concept which states that participation of related persons such as family, community, and organizations play a vital role in present paradigms of development, which can encourage interested persons to have sense of ownership, fellowship, and even delighted acceptance. The key means of participation consists of planning, processing, evaluating, and gaining related benefit. AIC approach becomes a main factor allowing related individuals to receive factual information and to share opinions so that they can become aware of diabetes care and tendency towards problems concerning diabetes. The process also allows every individual to come up with problem solutions and employ them in order to eliminate the problems concerning diabetes in community. The findings of this study also found to be consistent with the previous studies which indicated the ego strength for self-caring in diabetes patients accompanied with integrated participation can promote the process of continuing care, so patients can be treated in a proper way. This leads to a situation in which patients obtain better behavior and have higher control of blood sugar.

## Conclusion

The development of community participation is very important. The AIC technique led to fulfill the improvement of relationship and creation of trust and respect between researcher, health personnel and community members as well as focus on empowerment and transferring power to all of them. It is a proper community developing tool for health personnel to approach community for improving the health care services for type 2 diabetes mellitus patients. This process was able to make better diabetes knowledge and confident practices of diabetics. Health personnel, diabetes patients, caregivers, villager health volunteers and villager leaders access problems for diabetics, proper health care services and better family and community supports. Particularly, every related individual and organization should be given opportunities to determine policy and means to develop the quality of diabetes care in order to address problems, meet expectation, and satisfy needs diabetes care. The effects of Appreciation Influence Control (AIC) technique led the gathering participants perceived and was aware of their problems. They have the opportunity to express their views and making developing activities for improving in health care services for type 2 diabetes mellitus patients. They participated in improving health care services according to their perspectives and having satisfaction in their cooperating outcomes.

## Recommendations

1. The study highlighted the importance of better diabetes knowledge and practices' patients and active community participation. Therefore, health personnel

should employ AIC technique to improve and solve diabetes problems in community.

2. Health personnel should be supported in applying AIC technique to approach other community problems or other chronic disease at SDPH.

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