



Clinical Group

# Global Journal of Medical and Clinical Case Reports

ISSN: 2455-5282

DOI

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**Dates:** Received: 15 December, 2016; Accepted: 21 December, 2016; Published: 22 December, 2016

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**Keywords:** CIPP model; Diabetes management; Community setting; Low sugar volunteers

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## Research Article

# CIPP Model Evaluation of a Collaborative Diabetic Management in Community Setting

## Abstract

Diabetic management requires a continuous assessment of performance, looking at successes and failures. Especially in community setting, the development of a Collaborative Diabetes Management [CDM], Low Sugar Volunteers [LSVs], core-community working group, vigorously participated in all community activities to manage diabetes disease and its relevance. CIPP model was used to guide an evaluation of all activities that happened during a CDM development. Context, input, process, product, and appraisal sustainability were presented via LSVs community driven. CDM via community participation strategies prejudiced community health impacts, community health policy, and community sustainability. Moreover, various findings from CDM development influence actions and community direction either immediately or in the future.

## Abbreviations

CIPP model: Context, Input, Process, and Product Model; CDM: Collaborative Diabetes Management; LSVs: Low Sugar Volunteers

## Background

Globally, the prevalence rate of diabetes is continuously increasing; the number of persons with diabetes in 2010 was 285 million, with a prevalence of 6.4%. By the year 2030, the estimated number is expected to be 439 million with a prevalence of 7.7% [1]. In Thailand, the national prevalence of diabetes in Thai people was also increasing and have high rate of the top ten in Asia [2]. Of these, 35.4% were not previously diagnosed [3]. Diabetic complications also have continuously increased, the number of deaths in adults due to diabetes is estimated to be 3.96 million per year and the mortality rate of diabetes in all ages is 6.8% at the global level [4,5]. To achieved the effective development strategies through active engagement with, and participation from all stakeholders at individual, family, community, societal and national levels. Successful implementation of the plan will ultimately lead to a sufficiency health system and a happy and peaceful society [6]. Thus, the management for diabetes should develop from the participation of each group's competency. For sustainable diabetes management, the development of continuous interventions and strategies sharing decision-making will develop a collaborative management that is effective for

diabetes management in the community setting [7,8]. The collaboration between community and academic resources should develop and maintain diabetes management and the understanding of diabetes situations. Similarly, the community workers helps the community to preserve the health of its members and promote self-care among individuals and families, besides identifying the high-risk aggregates in the community and the development of appropriate interventions to ensure accessible services for the whole population [9]. As to the academic roles, the researcher will offer and justify the effective strategies required to develop effective interventions, by enhancing skills and building competencies for community capacity by promoting community participation applied as a form to ascertain the diabetes management in the community setting, shaped on the method of action research.

In community setting, where were risk persons and persons living with diabetes, they have to participate in all daily life of community activities. Especially, the local tradition was emphasized the group or community activities by all residents. It is importance to develop the effective interventions that appropriate with their lifestyle for sustainable development. Formerly, the comprehensive approach to diabetes management with both active and passive interventions for appropriate features is urgently required. In keeping with the increasing rate of diabetic complications among persons with diabetes and also the readiness of the community to participate in diabetes management, and based on the good participation



and well organization of local setting, all community partners together developed a Collaborative Diabetes Management: CDM [10], this project encouraged individual and local organizations to participate in all diabetic activities in the community.

Then, the collaboration between community and academic resources should develop and maintain self-management and the understanding of diabetes situations. As to the academic roles, the researcher will offer and justify the effective strategies that are required to develop effective interventions, by enhancing skills and building competencies for community capacity by promoting community participation [7,8]. This Collaborative Diabetes Management was developed for encouraging all community residences and local organizations to participate in every activity related to diabetes management. During employment of CDM, various methodologies were utilized for developing an effective diabetes management in the community including participating workshops, community brainstorming and discussion, community group meeting, community forum or public hearing, and community welfare. Six components were created for managing diabetes based on community participation as presented in Table 1. Therefore, this study aimed to evaluate the collaborative diabetes management in community setting that provided by local health volunteers, Low-Sugar Volunteers. They were representative from persons with diabetes, diabetic family caregivers, village health volunteers, community leaders, and other community stakeholders.

CIPP [Context, Input, Process, and Product] evaluation model is a comprehensive framework for conducting and reporting evaluation. Context evaluation assesses needs, problems, and opportunities as bases for defining goals and priorities and judging the significance of outcomes. Input evaluation assesses alternative approaches to meeting needs as a means of planning programs and allocating resources.

**Table 1:** Summarized six components of the Collaborative Diabetes Management [CDM] development:

Local community capacity building	Municipality government policy	DM management curriculum/community advocacy
<ul style="list-style-type: none"> <li>-Raising diabetes community awareness</li> <li>-Empowering for effective community core-working</li> <li>-Training for specific diabetes specialist</li> <li>-Generating diabetes community commitment</li> </ul>	<ul style="list-style-type: none"> <li>-Community policy for diabetes management: plans and acts</li> <li>-Community vision and missions</li> <li>-Community advisory broad committees</li> </ul>	<ul style="list-style-type: none"> <li>-LS curriculum and accessories were created</li> <li>-The appropriate diabetes consumption campaign</li> <li>-Yearly calendar for diabetes management</li> </ul>
Maximize used of community social capital	Community care and support	The lessons learned sharing
<ul style="list-style-type: none"> <li>-Diabetes integrating in local wisdom and tradition</li> <li>-Integrative in Religious lifestyle:                             <ul style="list-style-type: none"> <li>Drama for health,</li> <li>Diabetes complication screening in Buddha day's</li> <li>Low-sugar consumption for the Observing the religious precepts (ถือศีลลดกินหวาน)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>-Senior-junior LSV system</li> <li>-Family support core-group</li> <li>-Community group performance</li> <li>-Community moral supporting for LS persons</li> <li>-Integrative home visit team building</li> </ul>	<ul style="list-style-type: none"> <li>-Diabetes clinic knowledge distribution</li> <li>-Oral presentation</li> <li>-Social media</li> <li>-Newspaper</li> <li>-Annual year local government reports</li> <li>-Role models awarding</li> </ul>

Process evaluation assesses the implementation of plans to guide activities and later to help explain outcomes. Product evaluation identifies intended and unintended outcomes both to help keep the process on track and determine effectiveness [11,12]. Therefore, the continuous improvement of community activities as LSVs impacts should be evaluated via the appropriate methods.

## Materials and Methods

After-Action Review Study was guided by CIPP model to evaluate the collaborative management of diabetic problems in community setting. This study was reviewed and approved by the Research Ethics Review Committee Faculty of Nursing, Chiang Mai University. (Approval Code No. 116/2010) Participants were selected by purposive sampling consisting of community people who live in community. There were three groups of participants: community stakeholders, core-working group, and community residents. First, community stakeholders consisted of formal and informal community leaders. Second, core-working groups called Low Sugar Volunteers which composed of 15 village health volunteers, 13 persons with diabetes, 12 family caregivers, 1 municipal member, 2 leaders community group, and 2 healthcare providers; and 1 community member who willing to participate in all processes of the study. Finally, community residents were other people in community who affected from diabetes management activities.

The researchers, as one instrument, prepared the knowledge and skills on qualitative method in nursing research and take the role as the research facilitator, coordinator, and leader. An interview guide for focus group and semi-structured interviews were developed by the researcher and tape recordings were used as the research tools during evaluation of diabetes management in community setting. Also, an observational guide was used when the researcher participates in community events and during project activities. The creditability and confirmability were guided for trustworthiness of this study by using the triangulation technique by gathering the information from different sources: multiple data sources through focus group discussions, semi-structured interview, and participant observation, member checking that allows participants to check and verify the accuracy of the information recorded. For achieving the efficiency data, the researcher conducted the focus group and in-depth interview with the representative LSVs. These included persons with diabetes, family caregivers, village health volunteers, community leaders and other community residents. Moreover, the researcher conducted a participatory observation during all diabetic management activities in community setting. Moreover, content analysis was employed to analyze and classify words or statements from target group's opinions during focus groups and semi-structured interviews.

## Results

The findings of an evaluated Collaborative Diabetes Management [CDM] were presented after development of six components. These were presented as follows:



### Context evaluation

This community was ready to participate in any health activities according to the resident’s active health behaviors, local community leaders, local budgets allocations, and community resources. Various community readiness for diabetes management included human community resources, supportive budgets and local concerning. These were indorsed by the good co-operation from local organization including health care personal and local government officer willing to participate in all processes of this development. Opinion of community leaders presented as follows:

*“There are many community resources for raising every project: supported budgets from local municipality, local personal from our government office, and resident concerning.” (Community Leader)*

### Input evaluation

The participatory learning was used to create the active activities in all processed of development. As an important leader group, the LSVs performed preliminary roles for health education, based on responsible activities involving five modules of the Low-Sugar curriculum for the Low-Sugar school. The LSVs asked participants to share and discuss the problems and collaboratively find solutions by adjusting some procedures so as to enable activities to be carried out smoothly. They played significant roles in facilitating activities run as integrated comprehensive care in local activities included home visiting, health education and experience sharing, as well as community board committee advising. Opinions of community members were presented as follows:

*“...During the project implementation, I realized that I can consult you (the researcher) every time by phone or by mail. This made me more confident and secure in doing many activities with others related to diabetes management. Also, I provided information and other resources for my community residents to help them with on-going diabetes control efforts.” (Low-Sugar Volunteer)*

*“...When I take part in Low-Sugar projects, I apply and manage diabetes suppression by myself at home. When I have a problem I can consult the LSVs responsible in my community. They provide me with more information and suggest appropriate ways for diabetes management. I believe their recommendations because they have already received effective training from the specific providers. Especially, they have been trained to be community leaders, Low-Sugar Volunteers, for diabetes control.” (Person with diabetes)*

The commissioning continuous activities required continual stimulation and support of the processes of mutual-collaborative action research, which was achieved by developing strategic plans to promote the collaborative diabetes management to community by ensuring sustainability. These facilitating and consulting activities were provided at both levels, by the LSVs groups for community members, and the researcher for the core-working group. As the important leading group, LSVs performed preliminary roles for health educating based on all the activities of the five modules of the LS-curriculum for the LS-School. All LSVs asked participants to share and discuss their problems and collaboratively find

solutions by adjusting some procedures to enable activities to be carried out smoothly. They played significant roles for facilitating activity, running integrated comprehensive care in local activities that included incorporated home visiting, health education, experience-sharing and community board committee meeting.

### Process evaluation

Dering employment of the CDM development, various methodologies were utilized the effective diabetes management comprised of participating workshop, community brainstorming and discussion, community group meeting, community forum or public hearing as well as community welfare were displayed in Table 2.

### Product evaluation

After implementing of six CDM components, the effective community group for leading community health interventions especially in diabetic management. They were named “Low-Sugar Volunteers for Low-Sugar Community” and played important roles of health promotion education, prevention, and screening as well as good model of healthy people in their community. Various impacts form this development included:

### Community Impacts

After and during the development of the CDM, it was found that numerous community modifications were occasioned among persons with diabetes (individual consequences), and LSVs (community leaders consequences), as also community health policy and the sustainability. These consequences were elucidated as follows:

*“Before this project’s implementation, I thought that diabetes was a very dangerous disease. Although it was an urgent situation to be in, I did not prepare myself. I resisted in any way I could and did not accept anything, because nobody in my family was a diabetes patient. After and during joining this project, I changed my diabetes perceptions and was willing to admit I was a diabetes patient. Diabetes is not scary and we can live happily with others. Moreover, I have been able to share my feelings with other persons who have*

**Table 2:** Condensed process of the Collaborative Diabetes Management [CDM] development.

Strategies/ Objective	Participatory community workshop	Community brain storming and discussion	Community group meeting	Community forum and welfare
Community activity	To enabling all community participants in every local movements and create a collaborative team-working by holding a community working for every community stakeholders.	To emerge all participants raise their useful opinions, experiences related to diabetes management by group processes.	To provide the continuous monitoring all activities implementation.	To propose all locally collaborative community activities for receiving feedback from their residents.

been diabetes patients for a long time and have received much valuable information to about how to monitor myself.” (Person with diabetes)

Moreover, persons with diabetes received an increased flow of useful information and practical applications to diabetes lifestyle management. They claimed that the activities learned from this project improved their lifestyle behaviors relating to eating habits, increased physical activities, stress management, and treatment adherence. They started with minor behavioral changes and became totally committed. These project activities became immersed in their everyday lives once they tried to practice. The practical changes of the program’s participants are commented on as follows:

“I obtained useful strategies to control my blood sugar, such as various ways to exercise, the diabetes nutrition alternative behaviors, the local community herbs that I could apply to my diet, and appropriate ways to help myself. During group workshops, I received many strategies for preventing diabetes complication: the self-screening methods in order to eye and foot examination, the self-monitoring book record toward the measurement of blood sugar levels and blood pressure controlling. Interestingly, these activities provided me and my family monitor diabetes conditions together.” (Person with diabetes)

The LSVs (community leader’s consequence), the project’s activities advanced all LSVs increased essential capacity including diabetes overview and management, self-confidence, knowledge transporting skills, and healthy role model. They were approved in team working skills composed of leader and follower roles, cooperative acts, active monitoring, facilitating, and counseling as well as community devoting. Moreover, they increased essentially individual capacity related to diabetes encompassed of the diabetes overview: types; signs and symptoms; complication and prevention strategies also significant self-management support for persons with diabetes. Importantly, the skills for transporting these knowledge and techniques were encourage them increasing self-confidence. Likewise, these activities supported them to be healthy role model and accepted persons in diabetes phenomenon. Moreover, the networking for diabetes management in a community context were also created by sharing the lessons learned via verbal communication, community activities welfare, social media and newspaper. After community activities finished the LSVs presented their ideas related the project participation as follows:

“This project made me more self-confidence; I could present all diabetes knowledge to my community members. It provided the good opportunity for me and our community which encouraged all community members work together, supported all accessories for activity implementation. Importantly, you (the researcher) played the good role model to be the community health workers who stress-free to contact, good relationship and creative-thinking stimulator.” (Low-Sugar Volunteer)

“Not only useful diabetes information for my community management but I can utilize effective strategies for managing my diabetes conditions also. According to my community roles, I was developed to be community LSVs. My duties were health educating, transforming diabetes information, and providing effective and appropriate lifestyle activities for my community residences. Another

important role, I had to care my mother who was person with diabetes at home also. This project supported my responsiveness for my family member and prevented myself from diabetes also.” (Low-Sugar Volunteer)

“This project formed our community unity increasing. We learned more about group process, team working, and creative thinking. We are happy to participate in all activities regarding effective designs for diabetes management in community. There was significant changing for my community between before and after project implementation. We are proud to present “We are LSVs” and develop my community to be Low-Sugar Community also. Especially, we remembered all process development for applying to the other community problems.” (Low-Sugar Volunteer)

### Community health policy

The important community policy commitment for sustainable development was policy creation and expansion. The diabetes community policy was separated into two main sections included community action plans and policy implementation. These results were gained from local community key persons’ in-depth interview and focus group discussion with community participants as follows: the researcher together with LSVs and local community leaders created the community vision and mission for guiding diabetes management. Then they on-going developed the community action plans for collaborative thinking via LS curriculum and covered all community diabetes populations. This curriculum provided diabetes management guidelines for every community members. The community advisory board committees for diabetes management were established for useful suggestion and community resources supporting. Moreover, the appropriate suggestions related to model planning validity were approved by all community stakeholders before actions plans implemented.

### Sustainable community development

All community participants mentioned that the further collaboration between the local organization and community residents also with the key persons of each village should be supported by local municipality. These had significant influences on the community activity’s sustainability, and other community members especial the other persons with diabetes, their family caregivers, and local health volunteers still continually developed and maintained. Importantly, the development of effective group leaders was defined as LSVs for Low-Sugar Curriculum [LSC] which is the key factor of the constant successful community diabetes management. However, the local community leaders were established as community advisory board committees for community diabetes management also defined as the important factors for continuity and sustainability of this project. Also, to increase sense of community and community power, most of community activities were encouraged all community participation especially LSVs and local organization increased concerning for community health issues. These diabetes activities were fulfilled the needs through community membership by providing all community group workshops for empowering their community responsibility. After community activities

for diabetes management implemented, the community participants together generated the community declaration for Diabetes Management. This declaration was provided the commitment of three influencing organization related to community diabetes management including local municipality, Public Health Center, and LSVs group (representative from all significant persons relevant diabetes management in the community). And developed the community outcomes of their implemented was called 'The Innovative Health Promoting School' for generating the appropriate and creative community activities for diabetes issue and others.

Other significant factors for CDM sustainability in the future would be increased continually support resources from local municipality and the stimulated the innovative community participants' thinking. Also, the integration diabetes management in the local traditions was shown the effective diabetes interventions for community citizens. The group of persons with diabetes though it should be preferable for them to add more diabetic persons and persons in diabetes risks into this project. Effective community resources based on sufficiency economy should be promoted in the community members together with all their community local government organization for continuing diabetes management activities. Finally, community participants also though that the project should be promoted more for the whole community and local organization as well as in other health issues were expected to help improve the project and make it sustainable. After cooperative evaluation for sustainable development, the researcher and LSVs presented the successful project to the local government organization for proposing the outcomes and impacts from this project and sending the referral activities to develop the sustainable local community activities for diabetes management. All activities since the project beginning development to the last activities that all community members together established were presented by the researcher and LSVs. Before sending the referral information, the researcher and LSVs created the yearly diabetes management activities calendar for monitor all performances related diabetes in this community.

## Discussion

As results of this study, the community stakeholders had gained more knowledge, information, perceptions, attitudes, beliefs, skills, experiences, practices, confidence, and resources. Also, the CDM could encourage local organization and community residents collaborative to conduct activities for managing diabetes in the community setting. This community was opened for all community members influenced diabetes management including persons with diabetes, their family caregivers, local healthcare providers, and other people who interested were in need of undertaking diabetes management activities through community collaboration. The collaboration between local organization and community citizens provided a means for all community stakeholders to participate fully in the research process. This collaboration was an important foundation for a successful diabetes management intervention, which included practical activities for effective diabetes management and achieving a healthy community.

Additionally, sustainability of the activities is the ultimate goal of any community health project. Dean and Doherty & Mendenhall [13,14] indicated that social action focused on policy development can subsidize the collaboration and to continue sustainability. Moreover, short-term success contributes to long-term effectiveness of local activities. Long-term sustainability of this CDM should be continued development in the future through reimplementation of all processes development and contributing to the more effective collaboration management.

The provided participatory monitoring between the researcher and LSVs, and between the LSVs and their community members were created for all ongoing and finished community activities implementation. These provided all community participants and other stakeholders with the continuous feedback on implementation [15], identified actual or potential successes and problems as early as possible to facilitate timely adjustments to all community diabetes management operations. For the continuous evaluation, it is a periodic assessment of the CDM development relevant performance, efficiency, effectiveness, impact, and sustainability in relation of during implementation and terminal evaluation.

Both continuous monitoring and evaluation, they also provided a basis for accountability in the use of community resources. Given the greater transparency expected of the local community members and organization needed any respond to be success on the grassroots [15]. All activities of CDM development, monitoring and evaluation can help to strengthen development design and implementation and stimulate partnership with community stakeholders and members. Similarly with the study of Laverack & Wallerstein [16], the participatory monitoring and evaluation in primary health care empower communities and health workers to make informed decision on interventions, and performance; and promote collaboration, transparency, accountability and sustainability in community development. Therefore, the development of a collaborative diabetes management in the community was cooperated from local government organizations and community participants also the researcher. The various community activities covered community diabetes awareness and understanding, community diabetes support, community diabetes involvement ultimate to the community commitment for sustainable diabetes management.

## Conclusions

Based on the collaboration of community group activities empowered all community members and local organization, this promoted all diabetes conditions via local policies development related to diabetes management between community members and the local municipality. The sustainable achievement for diabetes management through the creation of continuous monitoring and active evaluation, construction of the local community policy, and building the Memorandum of Understanding [MOU] for generating the community declaration of diabetes management in the community. The significant factors forced successfulness of collaborative diabetes management in community setting was

the effective LSVs. The encouraged LSVs, community leaders and all community participants produced more creative think for protecting the boring activities. Some people were felt unable, low self-confidence, lacking of essential skills and knowledge to deal or run the project. After several training and also joining together as well as learning by doing from community collaborative workshops in the many times repeated, it also completely lead the feeling of empowerment for them. Importantly, achievement more interested community residences and other participants would always keep in mind in every step and also disseminate the findings for everyone participated including reflect the finding to the whole community could encouraged more motivation for other community interested residences to join.

For community collaboration, the researcher should always be conscious that community participants is the project mobilizer and the researcher is taking a role as the facilitator & trigger in the project. The researcher should reassure and affirm the community participants' competence and worth. The researcher needed to be a good listener, supporter and encouragement, trustable, flexible, and respectful, be always punctual, keep promise, and be patient, stay in commitment and importantly contribution and activities run by the community committees and fulfill the pride of the member on their contribution to the project, be award and motivate for further running the project. Importantly, the researchers should be immersed themselves as the normal community members, joining all local community activities in both formal and informal movement for deep understanding community context.

## Acknowledgement

This study was financially supported by the Office of the Higher Education Commission [OHEC], Ministry of Education of Thailand, without which the present study could not have been completed.

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