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Original article

Effects of family members' empowerment program on family members' food preparing behaviors for elderly diabetic patients

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Background: The lose power of family members which leads to inappropriate food preparations behaviors for elderly diabetics. As a result, older people with diabetes control the blood sugar level more difficult. Empowering family members in the appropriate food preparations behavior will help elderly diabetes patients have the right dietary behavior, while enabling normal control of the progression of the disease to normal conditions.
Objective: To study the effects of a family member empowerment program on family members' food preparation behaviors for elderly diabetic patients.
Methods: The subjects were family members aged 25 - 59 years who performed the main duty of preparing food for elderly diabetic patients, with 33 people in each group. Data collection tools are three questionnaires and empowerment program administered over a period of six weeks.
Results: The program contributed to higher mean scores for the food preparation behavior of family members who were caregivers for elderly diabetic patients in the experimental group than in the control group. Furthermore, the experimental group had significantly higher mean posttest scores than pretest scores, while there were no differences in the pre- and posttest mean scores for the food preparation behaviors in the control group.
Conclusions: The empowerment program received by the family members of elderly diabetic patients gave family members of elderly diabetic patients' self-confidence and feelings of being empowered to prepare appropriate foods for elderly diabetic patients.

Keywords: Empowerment program, family members, food preparation behaviors, elderly diabetic patients.

Diabetes mellitus (DM) is both constantly life-threatening and growing in severity, because the trend for illness with DM is escalating both in the global and Thai populations. According to statistics on DM at the global level in 2015, 415 million people had DM. Furthermore, the number of DM patients is expected to increase to 642 million people by 2040. [(1)] In Thailand, the number of DM patients increases every year, rising from 2,408,866 million people in 2015 to 2,661,312 million people in 2017. DM is more prevalent in the elderly age group than in younger groups. The incidence rate of DM in the group aged 60 years and above has increased from 1,227,590 people (17.47%) in 2015 to 1,464,270 people (18.54%) in 2017. [(2)] Similary, the number of elderly people with DM registered with Public Health Service Center 35, Huamark, Bangkok, has increased from 61.11 % in 2017 to 67.72 % in 2018. [(3)]

The rising numbers of people with DM in the elderly age group continues to be a public health problem, because elderly people with DM are unable to maintain continual dietary control. [(4)] Thus, it is necessary for the elderly to have their diets managed by family members. Families in which family members prepare foods for elderly diabetic patients tend to help elderly patients engage in the right dietary behavior, while enabling normal control of the progression of the disease. [(5)]

Empowering family members in food preparations for elderly diabetics involves promoting behavior among family members whose main task is to provide care for elderly diabetics in making decisions to buy

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the ingredients for cooking, seasoning food, choosing to buy processed foods and preparing the right foods for people with DM. Thus, it is the duty of community nurse practitioners to both assist and support the family members of elderly diabetic patients to assessment family problems, sharing experiences and seek guidelines for making decisions about selecting problem-solving practices for food preparations on their own. From the literreture review, empowering family members in families with elderly diabetic patients involved studies on the following 3 issues: 1) administering the family empowerment program in families with elderly diabetic patients; 2) studying the factors involved in empowering family members in families with elderly diabetic patients; and 3) conducting research for the development of a handbook for measuring the empowerment of family members in families with elderly diabetic patients. [4, 8 - 10] Most studies have been aimed at promoting empowerment in elderly diabetics to eat the right foods in order to enable blood glucose levels on their own more than at empowerment of family members. [6, 11] In addition, elderly people have limitations in preparing food. Therefore, family members are important in food preparations for the elderly, particularly in the group of elderly with DM who need to have the right food prepared for them.

According to the literature review, most family members in Bangkok that are providing care for elderly diabetic patients are of working age. Thus, these family members have limitations in preparing food for elderly diabetics. Furthermore, it is popular for consumers to buy fast food. Thus, they are unable to control the cooking of the right food for diabetic diets and elderly diabetics consume foods that are wrong, insufficient, in the wrong portions and in excess of the right amounts. [16] Moreover, family members have misunderstandings about the right diets for elderly diabetics, prepare the wrong types of food for elderly diabetics in the morning and prepare large meals for elderly diabetics in the evenings. [6] In addition, family members continue to perceive that elderly diabetics can take care of their own health. Family members also think that public health personnel and public health village volunteers take care of elderly diabetics. Therefore, the family members are not very interested in preparing the right foods for elderly diabetics. [17] These factors lead to a loss of empowerment on the part of family members in preparing food for their elderly diabetics.

According to the review of literature similar to the present study conducted by the researcher that apply Gibson's empowerment framework, studies have been aimed at developing and creating empowerment programs for family members who prepare food for elderly diabetics. According to the findings, the programs have improved caregivers' behaviors in providing care for elderly diabetics, while the health conditions of elderly diabetics have also improved. [11, 12] Nevertheless, some of the studies were found to differ from the present study in terms of the empowerment activities that were aimed at proper food preparation behavior, and the unique characteristics of the sample and the context in the Bangkok area. In addition, studies about promoting empowerment for caregivers of DM patients and caregivers of patients with other diseases. Most of the aforementioned studies have implemented Gibson's empowerment framework and positive behavioral outcomes. [4, 6 - 8, 11 - 14, 18, 19] Furthermore, the empowerment program created by the researcher applied Gibson's empowerment framework as the conceptual framework because Gibson's empowerment framework [15] is appropriate for the characteristics of the family members in the families of the elderly diabetic subjects and the context of Bangkok. Gibson's empowerment framework empowers the family members of elderly diabetic patients with competence in proper food preparations for elderly diabetic patients through four steps that cause the family members to seek information about the real situation as they further seek information on the problems involved in food preparations for the family. The family members engage in critical reflective thinking in order to gain understanding, acceptance and analysis of the causes of the aforementioned problems surrounding them, which led to searches for methods or guidelines to help them decide on the right practice methods with hands-on practice in order to maintain efficient methods on a continual basis. The activities were conducted over a period of six weeks and are expected to cause the family members to adopt the right food preparations for elderly diabetic patients, delay the complications of the disease and ensure that families eat the right foods in combination with care for elderly family members to reduce the risks for DM. Furthermore, health care personnel can serve as a significant information resource for in food preparations for elderly diabetics with guidelines for

developing programs where family members help prepare the right foods for elderly diabetics with sustainability for the future.

We hypothesized that after the program, the family members who receive the empowerment program would have a higher mean score on food preparation behaviors for elderly diabetic patients than family members who do not receive the empowerment program.

The family members who receive the empowerment program would have a higher mean post-test score of food preparation behaviors for elderly diabetic patients after receiving the program than their pre-test score before receiving the program.

The family members who do not receive the empowerment program will have no differences in pre- and posttest mean scores for in preparing food for elderly diabetic patients.

Materials and methods

This project was certified by the Institutional Review Board (IRB), Faculty of Nursing, Mahidol University, No. IRB – NS2018/71.0312 dated 16 January 2019. A quasi-experimental research design with two groups applied Gibson's empowerment framework as the conceptual framework. Simple random sampling was used to select two communities from Bangkapi, Bangkok. Then, the 66 participants were lottery randomly selected from each community with 33 subjects in each group. The subjects were family members aged 25 - 59 years who performed the main duty of preparing food for elderly diabetic patients who were aged 60 - 80 years and living in two communities in Bangkok, Thailand.

Instrumentation

The instrumentation used in this research are 2 sets of details as follows:

Set 1 – Data collection instruments consisted of:

The demographic data questionnaire contained 14 questions. The short answers were clarified about gender, age, religion, marital status, level of education, occupation, living with elderly diabetic patients, family economic status, chronic diseases, relationship with elderly diabetic patients and time spent to care for elderly diabetic patients, food tastes and food types, frequency of food preparation for elderly diabetic patients. The family member spent 10 minute to answer the demographic data questionnaire.

The scale for measuring knowledge on diabetes and foods for elderly diabetic patients was developed by the researcher based on the literature review. The family members who are the principle caregiver on food preparation for elderly diabetic patient took 20 minutes to complete the scale. This scale contained 25 questions on a 3-level rating scale (Yes, No, Not Sure) with a scoring range from 0 – 25 points. Higher score means that family members have more knowledge about diabetes and food preparation behavior for elderly diabetic. This scale had a reliability (KR 20) score of 0.81

The food preparation behavior for elderly diabetic patients' instrument created by the researcher based on the literature review. The participants answered about choosing the type/ type of food, nutrient content, energy of nutrients, exchange food, food label and nutrition labels considerations, how to cook and the taste of food by taking 30 minutes to complete the questionnaire. The instrument contained 27 questions on a 5-level rating scale ranging from 0 (Never Practiced) or 4 (Regularly Practiced) with a scoring range from 0 – 108 points. Higer score means that family members have better food preparation for elderly diabetic. The instrument has Cronbach's Alpha Coefficient at 0.75

***Set 2 – The instruments used in the experiment* consisted of the following:**

The family members' empowerment program was created by the researcher based on Gibson's Empowerment Framework with seven activities consisting of four group activities at Weeks 1, 2, 3, 5 and one activity provided information on diabetic food menu through the LINE application for four days in Week 3 and two telephone follow-ups in Weeks 3 and 5, bringing the total time of activities to 6 weeks. The researcher searched for information based on a real situation employed, reflective critical thinking and decision-making about the selection of healthy practice, hands-on practice, and maintenance of efficient practice. Moreover, in the program, the researcher gave the handbook on knowledge of diabetes and food preparation for elderly diabetic patients to experimental family members group. The handbook had the following content related to diabetes: definition of diabetes, symptoms, presenting symptoms, causes, appropriate practices related to the disease, complications, treatment, food for diabetes, exchanged foods and calculated calories that elderly diabetic patients should receive each day in kilocalories.

This study collected the data from experimental group and control group as the following:

Experimental Group

The subjects completed three questionnaires consisting of the demographic data questionnaire, the scale for measuring knowledge on diabetes and foods for elderly diabetic patients and the food preparation behaviors for elderly diabetic patients' instrument by taking one hour to respond to the questions on Day 1 of Week 1. Then, the subjects received routine care from the public health service center and the empowerment program for a period of five weeks and one day. In the program, the subjects received the following information:

Step 1 – The searching for real situations was carried out on Day 1 of Week 1 for two hours. The knowledge of diabetes and food for elderly diabetic patients and food preparation behaviors were reported in order to raise awareness of personal data. Scheduled group activities were organized to exchange experiences in preparing food for each group and completed on the same day by dividing the subjects into three groups with eleven subjects in each group. Each group took two hours to perform the activities.

Step 2 –The researcher carried out group activities for reflective thinking on the food preparation behaviors of family members for elderly diabetic patients on Day 1 of Week 2. Each group took two hours to perform the activities. In addition, the researcher jointly analyzed food preparation problems and provided food preparation consultation in groups. The researcher provided general consultation for the entire group and diabetic food menus sent to the participants by using one LINE application per family.

Step 3 - On Day 1 of Week 3, the researcher provided general knowledge about diabetes and distributed handbooks on diabetes and food preparation for elderly diabetic patients in addition to providing opportunities for family members to ask questions about issues and organizing learning group activities with family members as models. On Days 2 - 5 of Week 3, the researcher began sending data via the LINE application to the participants for four days. The data received by the subjects were menu items for elderly diabetic patients. Messages were sent once per day with a length of 5 - 10 lines/message by taking 1 - 3 minutes/message to read.

Step 4 – Researcher discussed the problems and barriers of family members in preparing foods with one telephone follow-up on Day 7 of Week 3. For maintaining effective practice, researcher provided family member's encouragement, which took five minutes/family. On Day 1 of Week 5 and took two hours, the participants involved discussions regarding successful experiences in positive changes to food preparation behaviors. The participants who were unable to adjust food preparation behaviors or did not begin food preparation behaviors exchanged problems, barriers and modified food preparation plans of the participants for elderly diabetic patients along with encouraging and empowering participants. Then, on Day 1 of Week 6 with one telephone follow-up to speak regarding problems and barriers in preparing food among family members and provide reinforcement, which took five minutes/family. Finally, the participants received the scale for measuring knowledge of diabetes and food for elderly diabetic patients and the food preparation behaviors for elderly diabetic patients'instrument by taking 50 minutes to respond to the questions on Day 2 of Week 6.

Control group

The control group completed three questionnaires same as the experimental group by taking one hour to respond to the questions. The participants received routine care from the public health service center from Day 1 of Week 1 to Day 1 of Week 6. Then, the participants received the scale for measuring knowledge of diabetes and food for elderly diabetic patients and the original form for measuring the food preparation behaviors for elderly diabetic patients' instrument by taking 50 minutes to respond to the questions on Day 2 of Week 6.

Statistical analysis

Data analysis was performed by using the SPSS program as follows: The demographic data of the family members were analyzed by using frequency distribution, percentage, mean and standard deviation. The differences in the group demographic data of the experimental and control groups were compared by using the chi square testing.

Data were expressed as mean ± standard deviation (SD)The differences in the mean scores on food preparation behaviors among the family members of elderly diabetic patients between the control and experimental groups before receiving the empowerment program were compared by using unpaired *t* - test statistics and after receiving the empowerment program were compared by using analysis of covariance (ANCOVA) statistics.

The mean scores on food preparation behaviors among the family members of elderly diabetic patients in the control and experimental groups were compared before and after the empowerment program by using paired *t* - test statistics.

Results

Gender, marital status, level of education, occupation, living with elderly diabetic patients, frequency of food preparation for elderly diabetic patients, economic status, chronic diseases, relationship with elderly diabetic patients and time spent to care for elderly diabetic patients were found to be no significant difference.

The differences in the mean scores for food preparation behaviors among the family members with elderly diabetic patients in the control group were compared before and after the program by using paired *t* - test statistics, the results showed the mean scores for food preparation behaviors among the family members with elderly diabetic patients in the control group before after the program to be no significant difference ($P > 0.05$). After the program, the mean scores for food preparation behaviors among the family members with elderly diabetic patients (56.82 ± 4.99) were found to be slightly lower than before the program (57.03 ± 7.79) while behavior scores remained at a medium level.

The mean scores for food preparation behaviors among the family members with elderly diabetic patients in the experimental group were compared before and after the empowerment program and found significant differences ($P < 0.01$). The mean scores for food preparation behaviors among the family members with elderly diabetic patients after the program (96.42 ± 5.46) were found to be higher than before the program (56.85 ± 7.35).

Regarding the differences in mean food preparation scores, the experimental group had a higher mean score for food preparation behaviors than the family members with elderly diabetic patients in the control group. Therefore, after the program, the control group had the same food preparation behavior scores for elderly diabetic patients as before the study (2.10 ± 0.18) at a medium level. Furthermore, the experimental group had higher scores for food preparation behaviors for elderly diabetic patients (3.57 ± 0.20) at the highest level.

Discussion

Research Hypotheses 1 – The fact that the mean posttest food preparation behavior scores of the family members of elderly diabetic patients who received the empowerment program were higher than the mean food preparation behavior scores of the family members of elderly diabetics in the group that did not receive the empowerment program might have been due to the following: 1) the family members received skills in preparing food for elderly diabetic patients on their own under the knowledge received from the instructions about DM, food exchanges, food preparation demonstrations by using a food exchange model and calculations of the recommended daily kilocalorie intake of elderly diabetic family members. Furthermore, using the information in the handbooks they received helped in food preparations; 2) opportunities were made available for family members to prepare food for elderly diabetic patients at home; 3) the group activities arranged for exchanges of lessons learned and successful experiences caused the family members to gain self-confidence and feelings of empowerment; and, 4) the research design was compatible with the research methodology; thus, the mean food preparation behavior scores were

Table 1. Comparing the mean food preparation behavior scores of family members with elderly diabetic patients between the control and experimental group after receiving the empowerment program.

Source of variation	SS	MS	F	*P* - value
Food preparation behavior	0.97	0.97	0.04	0.85
Group	25,874.85	25,874.85	932.56	< 0.001
Error	1,748.00	27.75		
Total	415,105			

SS = Sum of Squares, MS = Mean of Squares

higher in the group receiving the empowerment program than in the group that did not receive the program. The above finding was consistent with a statement from the empowerment concept that empowerment causes a person to feel self-confident and empowered to control personal living conditions or lifestyles, thereby improving the person's healthcare behaviors. [15] Similarly, the empowerment program received by the family members of elderly diabetic patients in this study gave family members of elderly diabetic patients' self-confidence and feelings of being empowered to prepare appropriate foods for elderly diabetic patients. Thus, the family members of elderly diabetic patients had good food preparation behaviors. The findings concurred with a study conducted by Rungsa J, *et al.* [4] who showed that the elderly diabetic patients and caregivers who received knowledge concerning diabetes and care of elderly diabetic patients to have increased perception of empowerment, personal ability and capacity after receiving empowerment, causing the subjects to feel self-confident and empowered in healthcare. This resulted in better adjustments to behaviors in caring for elderly diabetic patients in addition to improving healthcare behaviors among elderly diabetic patients.

Research Hypotheses 2 – Family members who received the empowerment program had higher mean scores for food preparation behaviors for elderly diabetic patients after the program than before the program, possibly because the empowerment program was designed to provide family members of elderly diabetic patients with in-depth learning about food exchange preparations and calculations of calories that elderly diabetic patients should receive in each day, causing family members of elderly diabetic patients to have more appropriate food preparation behaviors. Furthermore, the empowerment program was designed to use model family members with experience in food care for elderly diabetic patients. In addition, this finding might have been caused by exchanges of problems, barriers and adjustments to food care plans for elderly diabetic patients among family members of elderly diabetic patients in the experimental group. Experiences from model family members helped family members of elderly diabetic patients in the experimental group to have good food preparation examples, causing family members of elderly diabetic patients to have more appropriate adjustments to food preparation behaviors. This concurred with Gibson's concept which states a person has many guidelines for solving problems and the person's search for multiple problem-solving guidelines, such as exchanging learning and information with other persons, will help that person have guidelines to accompany decisions to comply with the methods considered to be appropriate for the aforementioned persons as the best methods. The aforementioned process requires conversations, exchanges of opinions, learning, discussions and decision-making with others, giving the person for self-confidence and leading to effective problem-solving decisions. The findings were consistent with a study conducted by Baldoni NR, *et al.* [14] who reflected that activities to create shared learning between patients and nurses, experience exchanges and joint problem-solving improved healthcare behaviors especially eating behavior until patients were able to reduce accumulated blood sugar levels.

Research Hypotheses 3 – Family members who did not receive the empowerment program had equal mean scores for food preparation behaviors for elderly diabetic patients before and after the study, possibly because the family members lacked interactions with the researcher, had medium-level knowledge about diabetes, lacked real and accurate understanding of food preparation behaviors and usually prepared food for elderly diabetic patients based on personal preference. In addition, the family members had no guidelines or models involving food preparations for elderly diabetic patients. This was consistent with Gibson's concept, which states that interactions between nurses and clients are created from good relationships, trust and sympathy leading to cooperation and joint decision-making to yield outcomes in line with jointly established goals. The above finding is concurrent with a study conducted by Potipruk J, *et al.* [11] who showed that diabetic patients difficulted to control food consumption behaviors because the subjects did not receive instructions from nurses. Consequently, the subjects had no knowledge about setting food quantities and exchangeable foods. Furthermore, the subjects believed that eating bitter gourds would help reduce blood glucose levels without the need for dietary control. In the meantime, most caregivers of diabetic patients had inaccurate knowledge about diabetes due to the absence of previous training and education. The caregivers thought the diabetic patients were able to care for themselves or had public health personnel and public health volunteers in the village. As a result, the

caregivers had little interest in caring for the health and nutritional of the diabetic patients. Thus, the diabetic patients continued to be unable to control the disease because family members are not trained to have knowledge and not receiving skills training to aid and support patients in every area in order. Therefore resulting in diabetes patients not control blood glucose levels at normal levels. [17]

Conclusion

Family members who received the empowerment program had higher mean scores for food preparation behaviors for elderly diabetic patients after the program than before the program and higher than the family members of elderly diabetics in the group that did not receive the empowerment program. It means that the empowerment program helps the family members to seek information for resolving their the problems involved in elderly diabetic food preparations. The family members engage in critical reflective thinking in order to gain understanding, acceptance and analysis of the causes of the aforementioned problems surrounding them, which led to searches for methods or guidelines to help them decide on the right practice methods with hands-on practice in order to maintain efficient methods on a continual basis. Therefore, the family members feel self-confidence and empowered in healthcare after they receieved empowerment program. As a result, family membes can prepare appropriate foods for elderly diabetic patients.

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Conflict of interset

The authors, hereby, declare no conflict of interest.

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