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Promoting Family Health for Prediabetes Persons: Project Report

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ABSTRACT

Family health promotion is the most important goal of family nursing practice, Especially, in the present day which family has inappropriate living pattern that can impact on family members getting sick both body and mind. Thus, professional nurse and health personnel should have knowledge and skill of promoting family health. Application the related family theories and concepts should be analyzed based on each family context. Especially, family should involve as the health owner with awareness and accepting actual health risk situation. Families need to set their goal and cooperating within family system that can help them to be success. As project report presented in this paper, it could reflect the process of increasing family awareness, right perception, and accepting to have prediabetes person in family, and then they had developed their competency of health promotion to solve their problem that could help the persons free from diabetes. However, some families could not modify new health pattern and lifestyle with consistently, including lacking commitment and fatigue from working. Thus, nurses and health care personnel should strengthen family motivation and morale continuously. In addition, family nurse and health care team should develop new knowledge and skills from lesson learned both success and unsuccessful cases to increase understanding and developing more knowledge, including, effective interventions for achieving health outcomes.

Keywords

Family Health Promotion, Family Nursing, Prediabetes.

Introduction

At the present, global population are experiencing the issue of non-communicable diseases (NCDs) [1,2]. Diabetes is found in every population in the world and in all regions, including rural parts of low- and middle-income countries. The number of people with diabetes is steadily rising, with WHO estimating there were 422 million adults with diabetes worldwide in 2014. The age-adjusted prevalence in adults rose from 4.7% in 1980 to 8.5% in 2014, with the greatest rise in low- and middle-income countries compared to high- income countries [3]. The disease has these attributable factors: unbalanced or destroyed environment; lifestyles and living behaviors created by humans, whether intentionally or not. The latter could also be derived from lack of analysis, assessment, and prediction of self-practices with which to meet physical and psychosocial needs, e.g. production of beverages with alcohol, sugar, or addictive substances (tea, coffee, cigarettes, liquors,

energy drinks), instant food contained in packaging filled with preservatives, facilitative technologies to reduce uses of force and energy in various tasks (washing machines, cars, and laborsaving devices) which yield well productive benefits for trade and economy and, as well as more convenient lives [4]. However, these are found to dramatically affect lifestyles and health of individuals and families, particularly "family lifestyles" which have changed. The changes are seemingly in positive directions, with happiness, timeliness, and less time wasted. However, the changes also mean more money to be spent, and both positive and negative health impacts, e.g., the need to gain more earnings which results in stress, and the time and food ingested during each meal are not appropriate which render more energy to be excessively reserved. Inappropriate food refers to meals with high flour, fat, and sugar. This is also worsened by below-minimum ingestion of vegetables and fruits, as is attributed to the needs of fast food and sweet snack (such as doughnut and cookies) to save time during work or study days. These caveats pose malnutrition to the body, with excessive intake and accumulation of flour, fat, and

energy, resulting in obesity. The ingested fat is of saturated kind and is not good for health, raising the risk of arterial occlusive diseases, atherosclerosis, hypertension, lack of essential vitamins and minerals, health issues in body systems which include cancer [5]. Therefore, if individuals and families are still lack of the awareness and do not promptly change lifestyles in order to reduce and eliminate such risks, there will be higher chances of preventable diseases and ill health conditions for families, as well as chronic illnesses caused by preventable diseases. These diseases, e.g., diabetes mellitus and hypertension, need constant treatment and containment throughout the lives of the patients, with which expenses are spent unnecessarily. Such situations could be worsened in case of complicated illnesses caused by unwell disease containment, e.g., renal failure [4].

In fact, family development proceeds in steps within phases, in which each family must have capacity to successfully adapt to changes occurred during phases of development and growth from age and health conditions of each family member [6]. Family health promotion therefore needs to focus on support and assistance for family members to develop awareness, perceive significance, self-capacity, and determine on family process to teach and socialize values, believes, and knowledge on health [7]. Moreover, changes needed to be made on lifestyles of the members and families systemically to foster healthy conditions. Families need to focus on reduction and elimination of risks or risk factors to the members and families. Management of relevant factors, both internal and external to the families, which are influential to health conditions of families, is needed to be conducted exclusively, efficiently, and simultaneously. In this regard, understanding of concepts on health behaviors, promotion of positive factors, and elimination or reduction of such negative factors, could enable nurses to promote family health behaviors by promoting internal and external factors which pose positive effects or support health behavioral conducts of families. At the same time, nurses need to have an understanding on factors obstructing conducts of health behaviors for families. This could result in reduction, prevention, or elimination of such obstacles, as well as raise awareness for families to change factors, eliminate and reduce such obstructing factors or risks [7,8]. In this connection, nurses should analyze and apply appropriate theoretical concepts to promote family health efficiently and successfully. To do this, nurses and health personnel must have awareness and believe that family is a significantly influential unit to health conditions of an individual. In this regard, Bomar has emphasized the influence of a family on health conditions of an individual, in which each family member affects health conditions of each other, both biologically in which diseases or genetic disorders could be transmitted, or infections in which living in the same house plays key role [9].

To succeed in promoting family health, nurses and health personnel should have knowledge of theoretical concepts on "family", "family health", "theoretical concepts and models on family health promotion", and "concepts on family health nursing" to efficiently apply in related tasks which consequently could yield successful results. The example presented hereafter

is a study project on promoting health for family as a system. Model on health promotion behaviors by Pender, Murdaugh, & Parsons [10] was applied to appropriately conform to contexts of areas and target families. Processes of assessment and analysis for causal factors of issues from actual situations experienced by individuals and families, were then conducted. The acquired data was consequently used to design strategies for health promotion, which focused on reduction of illness risks, in which families were emphasized as the owner of their issues and needs throughout all the processes. In the same processes, nurses act as facilitator of knowledge, advice, counseling, empowerment, case management, and promoting families to share and learn collaboratively [11,12].

In this regard, family is influential to health conditions of individual and family system. If nurses or health personnel need to promote, prevent, or change any health-related behaviors of individuals and families, they need to proceed with firm awareness and believe that family is a self-capable system. Families are individually different in each one of them [13,14]. Any procedures related to family health promotion needs to understand believes, values, perceptions, and empower family to gain awareness and make decisions to change ways of life or family processes, which could consequently lead to results of self-developed good health These processes need nurses as partners, facilitators, and collaborators, to eventually and successfully contribute to good health conditions for families [15]. Thus, this article aims to present project example of operation with the application of relevant concepts on health promotion, nursing roles and approaches, to promote health among families with prediabetes persons. It also illustrates application of concepts to action in situations and real contexts in primary health services and introduces critical thoughts to reflect and share the knowledge with professions of nursing and health, as well as with any interested parties.

Promoting family health: Intervention Project for family with prediabetes persons

This project conducted based on the significance of currently, more people have been diagnosed with diabetes mellitus. About 422 million people worldwide have diabetes, the majority living in lowand middle- income countries and 1.6 million deaths are directly attributed to diabetes each year. Both the number of cases and the prevalence of diabetes have been steadily increasing over the past few decades [2]. Diabetes mellitus is a chronic disease problematic to public health tasks globally. The disease impacts ways of life and is uncurable. A health survey conducted on Thai people found that 35.4 % of diabetes mellitus had not previously diagnosed [16]. Some people have diabetes mellitus even though they have never been found to be risked or prediabetes from screening. Prediabetes is a condition defined as having blood glucose levels above normal but below the defined threshold of diabetes. It is considered to be an at-risk state, with high chances of developing diabetes. While, prediabetes is commonly an asymptomatic condition, there is always presence of prediabetes before the onset of diabetes [17]. If these people had undergone immediate screening, they would have more opportunity from care, health promotion, and prevention from type 2 diabetes mellitus [4,17,18].

The project was conducted at Nong Kung Thap Ma Subdistrict Health Promotion Hospital where have 11 villages as responsible areas. The village with the highest number of diabetes mellitus risked and prediabetes groups is Nong Kung Noi Pattana village [19]. There are also the prediabetes groups registered as new patients. Traditionally, after the screening of prediabetes groups, the primary service system of the health promotion hospital arranged for knowledge sharing on diabetes mellitus and prevention guidelines exclusively for risked and pre groups. The hospital also provided by-group health education, broadcasted relevant knowledge via broadcast towers and community radios, as well as monitor and assess blood sugar levels after 6 months. The outcomes suggested the risked groups still tend to increasingly become ill with diabetes mellitus every year. Even so, there are still no serious interventions and assessments to analyze relevant or influential factors in individual and family levels in this regard.

The project team applied the health promotion concept of Pender Murdaugh, & Parsons [10] to assess the situations of prediabetes persons and families regarding behaviors to prevent diabetes mellitus. The assessment was conducted in relation to health behaviors, perceptions on benefits of health behaviors, obstacles, self-capacity, feelings on behaviors, and interpersonal influences; particularly of families, in accordance with behaviors which are considered as risk factors. The behaviors included perceptions of health behaviors to prevent diabetes mellitus and care, control, as well as overseeing conducted by individuals in a family according to risk factors-e.g., food ingestion, weight control, physical exercises, management of stress and risk factors; especially, cigarettes and alcohol. The assessment data was then analyzed with consideration of factors affecting health behaviors to develop intervention of health promotion to prevent diabetes mellitus. The developed intervention improvements of activities to be appropriate for risk factor issues, needs, and ways of life which are diverse in each member with risks of prediabetes and their families. Health promotion for families with prediabetes members, therefore need to be appropriately conducted according to the needs of prediabetes members and families, to foster health behaviors to prevent diabetes mellitus and family functions providing interpersonal influences. These ensure promotion of health to prevent diabetes mellitus successfully. The project goal consisted of: 1) To enhance health behaviors to prevent diabetes mellitus in the prediabetes members, in the aspects of food consumption, weight control, physical exercises, stress control and emotional management, reduction of risk factors, and finger-stick glucose monitoring (DTX); 2) To strengthen families behaviors of conducts for prevention of diabetes mellitus for prediabetes members in the aspects of food regulation, weight control, encouragement of physical exercises, stress control and emotional management, and overseeing for reduction of risk factors, especially, tobacco and alcohol as well as obstacles. The target groups consisted of 12 prediabetes persons and 12 participants of family members. The project tools included health behavior assessment form for prediabetes persons and families, and an innovative media developed from situational analysis which is called "Life Ways to Slay Diabetes". All these tools have been considered by 3 experts of family medicine and family nurse practitioner.

Project Procedure

The project consisted of 3 phases. Phase 1 was the analysis of situations and problems, health behavioral assessment of prediabetes members and families in the prevention of diabetes mellitus. This phase applied the concepts of Pender Murdaugh, & Parsons [10] which consists of perceptions on benefits, obstacles, self-capacity, feeling towards behaviors, interpersonal and intersituational influences. The application of concepts facilitated assessment and diagnosis of problems and needs of prediabetes persons and their families, and developed activities and media for promotion of health behaviors to prevent diabetes mellitus. Phase 2 involved to conduct of change in health behaviors for prediabetes persons and families using the guidelines developed during Phase 1. Phase 3 engaged in evaluation of health behaviors among families and prediabetes members. The intervention took 4 weeks overall.

Tools for promotion of family health comprised of: 1) Guideline for conducting of family health promotion developed with analysis of data acquired from the intervention in phase 1 by interviewing prediabetes members and their families. The intervention has been conducted for 4 weeks, including implementation of a teaching material "Life Ways to Slay Diabetes". As the findings of situational analysis suggested the target groups had incorrect perceptions on the disease, deny risks of illness, and did not practice appropriate health behaviors. The project team took this data into consideration for planning of development of learning materials in 5 topics or charts.

Chart I "Diabetes Mellitus" was designed to motivate learning from past experiences and improve on which still lack understandings. It emphasized on changes of perception from "normal disease common for everybody", by arrangement of learning via media to illustrate pathways which reflect results and impacts of inappropriate life practices. This eventually made prediabetes members change their perceptions from the material "Eventually, I have diabetes", which could change perceptions on benefits of conducts and emotions towards behaviors. The employment of such materials results in perceptions of self- capacity of both prediabetes persons and families in their roles of health promotion to further prevent diabetes mellitus for the prediabetes persons.

Chart 2 "Life Paths and Diabetes Mellitus" is a learning material which aims to change perception on diabetes mellitus with new viewpoints. It emphasizes "prediabetes groups with no visible symptoms" by comparing blood sugar levels, aiming to encourage understandings of symptoms during sickness and complicated diseases, and increasing perceptions on capacity of oneself and capacity to see benefits of behavioral changes to prevent diabetes mellitus. Chart 3 "Diabetes-Free Ways" determines to raise awareness and expectations on benefits of conducts to prevent diabetes mellitus. It also presents issues to promote understandings on forms of daily lifestyles, covering influential risk factors. Chart 4 "The Paths Towards Diabetes" fosters awareness for prediabetes persons and their families, to encourage and empower them in jointly and seriously overcoming obstacles to prevention

of diabetes mellitus. The last chart, Chart 5 is called "Food Preventing Diabetes".

Project evaluation and discussion

General information of prediabetes persons and families: Among the 12 prediabetes persons, there are 7 males and 5 females. All of them are between 40 - 74 years of age, with 7 persons of 15-59 years, and 5 of 60 and over years. Regarding role and relationships within families, there are 7 husbands, and followed with 4 mothers. Eight persons are farmers and followed by 6 of them which are general employees. Eight persons has primary education as their highest education. For monthly income, most of them (5 persons) earn 6,000-10,000 baht/month, while one of them does not have earnings (being housewife).

For 12 family members, there are 3 males and 9 females. They are between 30-76 years of age. Most are between 30-39 years (5 people), with 1 as an elderly. Regarding roles and functions within family, 7 people are wives and followed by 4 children. For education, 8 people have graduated with primary education as

the highest degree. For occupation, most of the family members (7 people) work as farmers, and one who are unemployed. For monthly earnings, 6 people earn 1,000 –5 ,000 baht/month, followed with 5 people which earn 6 ,000 - 10 ,000 baht/month. Lastly, for family types, there are 7 extended families, which 5 are nuclear families.

Health data of DM-risked members prior to promote health

Assessment of health conditions and physical examination of risked members revealed that six people have over waist sizes (male > 90 cm, female > 80 cm) (4 females and 2 males). Nine people have over-standard body mass indexes (BMI \geq 23), of whom are 5 males and 4 females. All prediabetes persons have normal blood pressures (< 140/90 mmHg). The details are displayed in Table 1.

After the intervention of health promotion for prediabetes individuals and families in all 3 phases, the results of blood sugar monitoring (DTX) reveal 9 members whose blood sugar levels have reduced to normal level. The other 3 members have also seen reduction of blood sugar levels. Although still higher than

Table 1: Health data of the prediabetes persons before intervention (n = 12).

No.	Sex	Waist Size (Criteria: male ≤ 90 cm, female ≤ 80 cm.)	Height (Centimeter)	Weight (Kilogram)	BMI (Criteria: BMI < 23)	BP (Criteria: < 140/90 mmHg)	DTX (mg/dl)
1	Female	71	155	49	20.39	109/74	107
2	Female	114	165	85	31.22	115/76	114
3	Male	81	155	49	20.39	109/74	107
4	Male	89	165	68	24.97	119/74	111
5	Female	88	150	71	25.76	118/72	117
6	Male	69	160	58	22.65	114/80	108
7	Male	90	165	67	24.6	119/75	102
8	Male	91	158	60	24.03	111/64	101
9	Male	87	173	72	24.05	135/86	107
10	Female	104	150	65	28.88	126/87	114
11	Female	102	155	62	25.8	119/76	103
12	Male	117	165	84	30.85	136/92	106

Table 2: Results of comparisons of blood sugar levels before and after participating in health promotion activities for families with prediabetes persons.

Duadiahatas nausan N-12	Blood Sug	ar Level (DTX)	Difference Value of DTX Before-After	
Prediabetes person N=12	Before	After	intervention	
1	107	90	17	
2	114	81	33	
3	107	89	18	
4*	111	109	2	
5	117	99	18	
6	108	75	33	
7	102	82	20	
8	101	85	16	
9*	107	101	6	
10	114	81	33	
11	103	79	24	
12	106	100	6	
Min, Max Median	102,117	75,109	2, 33	
Ivini, Iviax Iviedian	107	87	16	

Note: Blood sugar level refers to results of finger blood glucose monitoring, in which after interventions of health promotion to prevent diabetes mellitus, the blood sugar levels after 8 hour fasting reveal to be at prediabetes level (100-125 mg/dl).

Table 3: Health behaviors of prediabetes persons and families prior to the intervention of promoting family health.

Health Behaviors	Prediabetes Persons	Family members
Perceptions on Diabetes Mellitus	 (N=12) Caused from multiple causes; genetic, obesity, aging, eating more sticky rice, unmindful eating, eating sweet/fatty/salty food, drinking alcohol Disease of multiple symptoms; fatigue, frequent urination, slow healing wound, overabundant water intake Need of continuous treatment, uncurable, and has multiple complications e.g., renal failure, and stroke 	 It is caused from several factors, e.g., inheritance, obesity, being elderly, over consumption of sticky rice, eating sweet/fatty/salty food There are several symptoms, e.g., frequent urination, slow healing wound, fatigue, and overly frequent hunger It is a disease in need of continue treatment, be uncurable, and has multiple complications, e.g., renal failure, hypertension, hyperlipidemia.
Perceptions on Risks of Diabetes Mellitus	No risked: They can work as normally, no symptoms, being thin and no genetic inheritances. Risked to DM due to high blood sugar levels, obese, have genetic inheritances, and like to eat sweet/fatty/fried food	No risked: the prediabetes persons work as normally, look strong, no symptoms, eat local native food, do not eat sweet and fatty food Risked to DM due to genetic inheritances, and obese.
3. Perceptions on Causes of Diabetes Mellitus Risks	Uninformed of causes due to no symptoms, and be able to work normally Caused from eating abundantly, and obese.	Caused from poor eating habit; e.g., eat stir-fried/fried/fatty/sweet food, unmindful eating, overabundant eating, obesity, and genetic history
Perceptions on Individuals risk within Families	No risked; be able to work normally and no symptoms. Risked due to obesity, eating overabundantly, and genetic background.	No risked; healthy, no symptoms, work as normally, and no genetic inheritances Risked from genetic inheritances, and obese
5. Practice to Prevent Diabetes Mellitus	Not practice due to being normal, no risk, working as normally, no any symptoms, no family history Some practice by controlling diet, body weight, and exercise frequently	Not practice due to no symptom and no available time Some practice; controlling type of food and cooking method; no sweet food, no fried or stir-fried food, including exercise with friends
Obstacles to Prevention of Diabetes Mellitus	 No obstacles; no illnesses, being able to live normally, strong and able to work Obstacles from own habit; eating much food, no exercise; drinking coffee, and alcohol, pain at leg and knee Stress; overthinking about family issues (debts, expenses, individuals within family) 	 No obstacles; no changes, perform daily lives in the same way (work hard, and not exercise). Barriers of no time to exercise due to routine household, job, and need more relaxation)
7. Responsible Parties with Roles in Caring and Promoting to prevent DM	Public health officers Village health volunteers (VHVs) Being responsible by themselves for being healthy	 Public health officers from health promotion hospital Village health Volunteers (VHVs) Being responsible by themselves to prevent DM due to family history of DM
8. Individuals Facilitating Practices for Prevention of DM	Monitor and measure blood sugar levels by VHVs Controlling food, weight, and attempting to exercise by own selves VHVs advise on conducts to prevent DM.	Public health officers; monitor blood sugar levels, advise and educate on prevention, counselling on practices VHVs; monitor and educate on prevention, and alert for both individuals and families to practice Prediabetes persons must be able to control themselves; eat less, stop or decrease to smoke and drink alcohol

the normal levels, they are considered as low risk levels (2), as illustrated in Table 2.

As content analysis data that was assessed by interviewing the participants displayed important issues on health behaviors relevant to the concepts of Health Promotion of Pender prior to the intervention of health promotion. This is illustrated in Table 3.

Discussion

This project was focused on promoting health of families with prediabetes members at one village in Udon Thani province, Thailand.[19] Using the conceptual frameworks of Pender, Murdaugh, & Parsons [14], the project was operated for 4 weeks, categorizing the interventions into 3 phases: (1) Phase 1 which involves analysis of situations, issues, health behaviors of families and form development, as well as media related to health promotion; (2) Phase 2 which engaged in health behavioral changes of families, comprising of education with media on prevention of diabetes mellitus, monitoring/alerting/and encouraging at home by VHVs, as well as telephone counseling; and, (3) Phase 3 which was about evaluation of blood sugar level results (DTX), and

health behavioral assessment of prediabetes persons and families. The results of this project display that for health behaviors of prediabetes members and families, they are incorrect perceptions on diabetes mellitus, both in the aspects of symptoms and practices. There is a perception that they are not risked of the illness since there are no symptoms and no genetic inheritance. Therefore they, both prediabetes individuals and family members, do not practice health behaviors to prevent diabetes mellitus. Families do not function in caring for the health of the members as they perceive no symptoms for the risked members. Current health behaviors of the prediabetes persons and families are found to be inappropriate, particularly in the behaviors of food consumption, physical exercise, and management of daily stress, all of which have mutual risk factors of smoking and drinking. The results of health promotion project for families with prediabetes members include reduction of blood sugar levels (DTX) among all 12 prediabetes members. However, it is found that 3 prediabetes persons are still unable to reduce and eliminate risk factors of smoking and drinking. Health promotion for families with prediabetes members, should accordingly be conducted with processes in which families are the owner of the problems [18, 20] The processes also need to analyze

health behaviors of families, both the systems, process, and related factors, in which the resulting data will be significant to planning and development of media for health promotion and capacity building to exclusively and efficiently prevent diabetes mellitus within families [20-24]. This includes changes in perceptions on appropriate health behaviors in the aspects of food consumption, weight control, physical exercises, stress control and emotional management, reduction of risk factors [25]; smoking and drinking, as well as family functions in caring and alerting the prediabetes members simultaneously and appropriately according to the issues as well as family lifestyles. However, the results of this study are found to be measured from finger blood sugar tests (DTX) 4 weeks after promoting family health. There were a few study groups and no groups to compare the results. Moreover, there were no simultaneous and sustainable follow ups on DTX results and family health behaviors. In this connection, there should be a long-term study and follow-up for development of efficient and effective health promotion methods and procedure, which could further yield results in accordance with defined objectives.

Conclusion and Suggestions

This project has objectives to suggest health promotion guidelines for families with prediabetes persons. The results at the biochemical level, i.e., finger blood sugar tests, at this village, illustrate an application of health promotion theories which have been constantly developed at individual level. The project is executed with emphasis on clear situational assessment of health behaviors among families and the risked members before designing the management, development, and change of health behaviors. The results of such procedures include reduction of blood sugar levels among all prediabetes members, although 3 of them are still at risked (low) level. Constant executions of the project could further increase the probability of accomplishing the objectives.

The aforementioned theories on health promotion at the present have seen developments of specific family health promotion theory of Loveland-Cherry [20] which consists of: general factors; influential factors for understanding health or illness conditions by family; factors on processes of instruction and training for self-health promotion of members within a family, and influences of individuals within family on the members; and factors with specific influences and strategies employed by family for objective-based health behavior promotion. Despite their origin of western culture, application of these theories on this project has seen some modifications on questionnaire guidelines to initiate the assessment to conform with the actual contexts. This is not originally defined within the theories, e.g., an interview initiates with "Do you think you risked of this disease?" in which almost all answers are "not risked since there are no symptoms and no such histories within the family". However, in the cases of individuals who perceive their own risks of diabetes mellitus, the perceptions are found to manifest from cognitions on the factors of family genetic inheritances. In this regard, users who want to apply any concepts or theories to practical use need to have firm awareness and experience from actual situations in order

to conduct appropriate analysis. This coupled with studies and reviews of past researches and studies would enable improvement as well as development of an appropriate application of concepts and theories. The application ranges from development of tools to assess relevant problems and factors, development of innovation conforming with family lifestyles, and raising awareness and alertness to risks posed on family members [21-24]. These could eventually lead to planning of interventions within families, functions of close overseeing and care based on feeling of care among all family members as a system [23,24]. Ultimately, for application of any relevant theories to be successful, it greatly depends on determination and understanding on theories and contexts of families a researcher needs to apply upon. Moreover, doing so would enable the researcher to further develop and deepen his/her knowledge, skills, and experience without ends.

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