

CHAPTER 2

LITERATURE REVIEW

Diabetes mellitus is a chronic illness and requires continuing medical care and education. It is well known that elevated blood glucose levels cause the development of microvascular complications in animal studies^[9]. In patients with insulin-dependent diabetes mellitus, relatively short periods of intense glycemic control resulted in an improvement of retinal fluorometry findings, nerve conduction velocities, renal hyperfiltrations and microalbuminuria.^[16-19] The Diabetes Control and Complication Trial (DCCT) shows a beneficial effect of intensive insulin treatment on the progression of diabetic retinopathy and nephropathy.^[20]

In non-insulin dependent diabetes mellitus, the most prominent metabolic abnormality present after the onset of NIDDM is hyperglycemia. The worse metabolic control has correlated well with a high prevalence of microvascular complications e.g., diabetic retinopathy^[21,22], diabetic nephropathy^[23] and macrovascular complications including the risk of recurrent myocardial infarction in established atherosclerosis^[24,25] and

amputation.^[26] The normal and near-normal metabolic control of diabetes mellitus are the goals of diabetic treatment which can be achievable from standard management including dietary control, exercise and drug therapy.^[10] These control strategies need diabetic education.

Diabetic education program was first provided to American diabetic patients in 1975 and the program was reviewed by National Diabetes Advisory Board in 1986.^[27] Diabetic educators requires a team approach. The key team members are nurses, physicians and nutritionists. The benefits of diabetic education in the treatment of diabetes mellitus, especially in those with NIDDM are improvements of self-care practices, metabolic control, emotional well being and weight reduction.^[19,28,29]

Mazzuca and colleagues^[11] provided systematic education in self-management of diabetes mellitus to 532 patients, 263 patients in the experimental group and 269 patients in the control group. The experimental group received 7 modules including lectures, discussions, audiovisual tapes, demonstrations, practice and behavior modification techniques for 14 months. The self-care

behavior, HbA_{1c}, body weight and blood pressure of the experimental group improved with statistical significance.

Kronsbein and colleagues^[30] provided structured treatment and teaching programs for NIDDM. The programs consisted of teaching sessions of 90-120 minutes weekly for four weeks, for the groups of 4-6 patients. The educators were paramedical personnel. The sessions included lectures, group discussions, practice and book records. The intervention group consisted of 50 patients from 5 clinics. The percentage of patients receiving sulfonylurea fell from 68% at the baseline to 38% after 1 year ($p < 0.001$), the mean weight loss was 2.7 kilograms ($p < 0.001$), but the average glycosylated hemoglobin remained unchanged (HbA_{1c} 7.1%).

Gruesser and colleagues^[31] evaluated their structured treatment by teaching 179 NIDDM patients. The diabetic education was provided as in groups for 90-120 minutes per week for 4 weeks. The content included diet control, exercise, drug therapy, complications of diabetes mellitus and how to care for themselves on sick-days. The teaching included lectures, practices and sharing experience among diabetic patients. The education has resulted in a 2.8 kilograms mean weight reduction in the

treatment group and the reduction of HbA_{1c} with a statistical significance.

In Thailand, Tantayotai^[32] conducted a study in 55 poorly controlled NIDDM by giving systematic diabetic teaching using color slides as the tool. Twelve weeks after teaching had been completed, the knowledge of the patients decreased when compared to the level of knowledge right after the teaching. There was no correlation between knowledge and metabolic control both before and after the diabetic teaching program.

Poomdandin^[33] studied a systematic instruction of self care in 80 diabetic patients; 40 patients were in the treatment group and 40 patients were in the control group. The knowledge, attitude, self care and fructosamine values of the treatment group improved with a statistical significance ($P < 0.01$).

Chanthamolee^[34] studied the effectiveness of a new approach in a health education program on self-care behavior in 168 NIDDM patients, 80 patients were in the treatment group and 88 patients were in the control group. The intervention was a three hours teaching program

consisted of a group discussion about self-care behavior, watching a video tape about diabetes mellitus and making a commitment to change their behavior. Six weeks and three months later, there was a statistically significant reduction in the knowledge, attitude and HbA_{1c} in the treatment group compared to the control group. HbA_{1c} at 12 weeks after the intervention also improved when compared to the control group with a statistical significance. This study was hampered by a selection bias since the treatment group had a higher rate of good metabolic control at baseline than the control group.

Many kinds of media have been used in conducting diabetic education, as mentioned above. The video tape about diabetic education is one of the tools for improving knowledge of diabetic patients. Mulrow and colleagues^[35] conducted a randomized controlled trial about diabetic education program designed for 120 obese NIDDM (body weight greater than 130 percent of ideal body weight) with low literacy and poor control as shown by the HbA_{1c}. Each subject was assigned to one of three groups: monthly group sessions with video tapes for diabetes with low literacy skills; monthly group sessions without video tapes; or no monthly sessions. After seven months, the difference of

body weight change in group 1 was 1 kilogram weight loss ($P < 0.05$) compared with a 0.1 kilogram loss and no change in group 2 and 3 respectively. This weight loss was not sustained at 11 months. There was no significant change in HbA_{1c} . The authors concluded that patient education programs did not result in a sustained glucose or weight control.

In Thailand there are few qualified diabetes nurse educators who can teach Thai diabetic patients. The development of proper video tapes to aid diabetic education for Thai diabetes patients with low literacy is still needed to cope with the lack of adequate educators. Achananuparp and colleagues^[15] performed the study of self-care education program for diabetes in five hospitals in the north, the northeast and the central parts of Thailand. The intervention included group and individual consultations with pamphlets and four volumes of video tapes about diabetic education which were produced to be the tools for teaching 140 patients in the intervention group and 151 patients in the control group. There was a statistically significant change of body mass index ($p < 0.05$). HbA_{1c} and fasting plasma glucose levels did not change. Because of inadequate diabetic nurse educators,

we hypothesized that video tapes about diabetic education plus nurse aid consultation would demonstrate an improvement in knowledge, practice and metabolic outcome.

This research intends to introduce the video tapes about diabetic education to the Thai diabetes patients in a teaching hospital and to acquire inferential information from the result that may help diabetic care providers develop a more practical and effective diabetic education program.

For economic study, there has been no report in Thailand, so it is worth to evaluate the cost-effectiveness of the two education alternatives to guide decision-makers in the establishment of diabetic education programs.