

CHAPTER 4

RESULT AND DISCUSSION

Findings of the Study

This research was designed to examine the effect of the supportive-developmental nursing program on self-care practices in patients with Type 2 diabetes. A purposive sampling was used to recruit 60 subjects from the Outpatient Department of University Hospital Science Malaysia who were divided into two groups; the control and the experimental group. The first 30 subjects in the control group received the usual care. The other 30 subjects in the experimental group received the usual care coupled with the supportive-developmental nursing program. Results of the study are presented in four sections as follows:

1. Subjects' characteristics
2. Comparison of age, duration of illness, and glucose level between the control and the experimental groups
3. Self-care practices of persons with Type 2 diabetes
4. Comparison of mean total scores of self-care practices between the control and the experimental groups

Subjects' characteristics

A total of sixty Type 2 diabetes patients who met the inclusion criteria were recruited for this study. Table 1 shows the demographic characteristics of subjects. Data of the control group revealed that the majority were male (53.3%), married (96.7%), and Muslim, (86.7%). The average years of age of the subjects were 53.33 (SD = 8.23) with an educational background of senior high school (33.3%). Most were retired (26.7%), had an income of about or less than 500 ringgit per month, and controlled their diabetes by oral medication and dietary control (66.7%).

In contrast, there were an equal number of male and female subjects in the experimental group. The average years of age of the subjects in the experimental group were 53.56 (SD = 10.37). The majority of the subjects were married (80%), Muslim (76.7%), and had attained senior high school (36.7%). Most were self-employed and

housewives (26.7%), had a monthly income between 501 and 1000 ringgit, and controlled their blood sugar level by oral medication.

Table 1

Frequency and percentage of subjects by demographic characteristics (N = 60).

Characteristics	Control group (n = 30)		Experimental group (n = 30)	
	n	%	n	%
Gender				
Male	16	(53.30)	15	(50.00)
Female	14	(46.70)	15	(50.00)
Religion				
Muslim	26	(86.70)	23	(76.70)
Christian	1	(3.30)	4	(13.30)
Buddhist	3	(10.00)	3	(10.00)
Formal education				
None	3	(10.00)	2	(6.70)
Elementary School	6	(20.00)	7	(23.30)
Junior High School	4	(13.30)	8	(26.70)
Senior High School	10	(33.30)	11	(36.70)
College or above	7	(23.30)	2	(6.70)
Marital status				
Single	1	(3.30)	2	(6.70)
Married	29	(96.70)	24	(80.00)
Widow	-	-	3	(10.00)
Divorced	-	-	1	(3.30)

Table 1 (continued)

	Control group (n = 30)		Experimental group (n = 30)	
	n	%	n	%
Occupation				
None	7	(23.30)	8	(26.70)
Retirement	8	(26.70)	5	(16.70)
Self-employment	4	(13.30)	8	(26.70)
Private employment	6	(20.00)	2	(6.70)
Government employment	5	(16.70)	7	(23.30)
Monthly Income (ringgit)				
≤ 500	12	(40.00)	4	(13.40)
501-1000	6	(20.00)	10	(33.30)
1001-2000	9	(30.00)	7	(13.30)
2001-3000	2	(6.70)	2	(6.60)
3001-4000	1	(3.30)	-	-
Treatment				
Oral medications	10	(33.30)	20	(66.70)
Oral medications and diet	20	(66.70)	10	(33.30)

Table 2 shows the comparison of ages, duration of illness, and glucose levels between the control and the experimental groups. T-test was applied to examine whether the control and the experimental groups were different in the three characteristics. The findings revealed that both groups were not statistically significantly different ($p < .05$).

Table 2

Comparison of age, duration of illness, and glucose level of persons with Type 2 diabetes in the control and the experimental groups (N = 60).

Characteristics	n	Mean	SD	t
Age (years)				
Control	30	53.33	8.23	.18 **
Experimental	30	53.56	10.37	
Duration of illness				
Control	30	1.67	.70	.57 **
Experimental	30	1.60	.66	
Glucose level				
Control	30	11.60	3.30	.28 **
Experimental	30	9.47	2.54	

* $p < .05$. ** $p < .01$.

Self-care practices of persons with Type 2 diabetes

Self-care practices were measured in five dimensions: dietary control, exercise, medication taking, stress management, and personal hygiene. The total and subtotal scores of self-care practices of the control and experimental groups are presented in Table 3. The subtotal scores were made comparable by dividing each dimension by total number of items in the dimension, making all subtotal scores range from 1 to 6, with the higher scores at the higher levels of self-care practice in each dimension. The highest pre-test score of the subtotal self-care practices of persons with Type 2 diabetes both in the control and experimental groups was personal hygiene and the lowest was stress management. In addition, the total self-care practice scores of the control and experimental groups ranging

from 44 to 264 were compared both at the pre-test and post-test periods. The results showed there were differences between the mean scores of both groups at both points of measurement.

Table 3

Pre-test and post-test mean scores and standard deviations on the total and subtotal self-care practices of the control and the experimental groups (N = 60).

Self-care practices	Control group (n = 60)		Experimental group (n = 60)	
	Pre-test Mean (SD)	Post-test Mean (SD)	Pre-test Mean (SD)	Post-test Mean (SD)
Dietary Control	2.88 (1.06)	2.90 (1.08)	1.87 (0.75)	4.11 (0.60)
Exercise	2.69 (1.11)	2.69 (1.05)	1.77 (0.81)	4.18 (0.76)
Medication taking	3.69 (1.10)	3.59 (0.98)	2.74 (1.13)	4.88 (0.54)
Stress management	2.08 (1.26)	1.98 (1.98)	1.36 (0.41)	3.69 (0.70)
Personal hygiene	4.16 (1.16)	4.16 (1.17)	3.13 (1.36)	5.17 (0.78)
Total	136.30 (40.56)	134.50 (37.83)	95.36 (25.66)	193.66 (21.25)

Analysis of covariance (ANCOVA) was performed to determine the mean difference between the total scores of self-care practices in the control and the experimental groups. Table 4 shows that the mean total scores of self-care practices at the fourth week, post intervention period, and between the groups were statistically different ($p < .01$) by using their pre-test scores of self-care practices as the covariate.

Table 4

Comparison of total scores of post-test self-care practices between the control group and experimental groups (N = 60).

Source of Variance	df	SS	MS	F
Covariate	1	39789.83	39789.83	177.44*
Between group	2	89775.61	89775.61	345.19*
Within group	57	14824.33	260.07	
Total	60	1722525.00		

* $p < .01$

Analysis of covariance (ANCOVA) was performed to determine the mean difference between the subtotal scores of self-care practices in the control and the experimental groups. Table 5 shows that the mean total scores of self-care practices at the fourth week of post intervention period, and between the groups were statistically different ($p < .01$), for dietary control, exercise, medication taking, stress management and personal hygiene by using their pre-test scores of self-care practices as the covariate.

Table 5

Comparison of post-test subtotal score of self-care practices of dietary control, exercise, medication taking, stress management, and personal hygiene between the control group and experimental groups (N = 60).

Source of Variance	df	SS	MS	F
Dietary control				
Covariate	1	2642.95	2642.95	122.69*
Between group	2	3841.80	3841.80	212.52*
Within group	57	1030.38		
Total	60	65380.00		
Exercise				
Covariate	1	2488.90	2488.90	99.00*
Between group	2	4646.35	4646.35	177.99*
Within group	57	1487.92		
Total	60	64131.00		
Medication taking				
Covariate	1	1368.97	1368.97	88.16*
Between group	2	2680.12	2680.12	158.54*
Within group	57	963.58		
Total	60	72965.00		
Stress management				
Covariate	1	2886.35	2886.35	109.90*
Between group	2	5621.02	5621.02	191.74*
Within group	57	1670.98		
Total	60	47334.00		
Personal hygiene				
Covariate	1	3118.63	3118.63	77.57*
Between group	2	2897.73	2897.73	103.09*
Within group	57	1602.06		
Total	60	112055.00		

*p < .01

Discussion

Discussion of the study findings is carried out in three parts. The first part focuses on characteristics of subjects, the second part focuses on self-care practices of Type 2 diabetes patients, and the third part discusses the effect of a supportive-developmental nursing program on their self-care practices.

Characteristics of subjects

Demographic characteristics of subjects with Type 2 diabetes are summarized in Table 1. It was found that the number of female and male subjects in the control and experimental groups were similar. The finding was congruent with previous studies (Mafauzy et al., 1999; Wild, Roglic, Green, Sicree & King, 2004), which found no differences in the prevalence of Type 2 diabetes between males and females.

Likewise, subjects in the control and experimental groups were middle aged. This finding was consistent with the high prevalence of NIDDM in Malaysia found in adults who were older than 40 years (Ali et al, 1993; Choi & Shi, 2001). As far as the characteristics of age, duration of illness, and glucose level of the subjects was concerned, t-test was applied to examine whether the control and the experimental groups were different with respect to the three characteristics. The findings showed that there were no statistically significant differences between the control and experimental groups (Table 2).

Most of the subjects were Muslim and married. The findings were congruent with the statistic of University Hospital Science Malaysia (2003) and the report of NHMS (1996). Since the majority of Malaysian is Malay, it was not surprising that the subjects both in the control and the experimental groups were Muslim. In addition, the subjects in both groups were similar in respect to the level of education, type of education, and level of income. Their educational backgrounds were mainly senior high school because the Eight Malaysian Plan (2003) previously stated that the minimum educational level of all Malaysians should be at least senior high school.

The occupation of a majority of the subjects in the control group were retiree and self-employed. Meanwhile, most of the subjects in the experimental group were housewives. This scenario happened because these people; retiree, housewives, and self-employed have more time to come to the clinic when compared to other middle age groups, especially working persons. For their level of income, the findings were congruent with most Malaysians who were in the lowest income group earning about 500 ringgit per

month (Eight Malaysian Plan Report, 2003). The subjects were treated by oral glycaemic agents. Generally, most patients with Type 2 diabetes who failed to respond to diet and exercises were potential to be treated by oral hyperglycaemic agents treatment (WHO, 2001). Thus, Glibenclamide was found as the primary drug of choice for controlling blood glucose level of persons with Type 2 diabetes.

Self-care practices of Type 2 diabetes patients

The results of this study showed that the total mean score at post-test of the control group which received usual care was decreased, while the post-test score of the experimental group which received usual care coupled with the supportive-developmental nursing program was increased (Table 3). Table 3 showed that the highest mean score of self-care practice was personal hygiene and the lowest was stress management. Generally, performing personal hygiene was an activity in daily living of human being. Especially, most of the subjects were Muslim who had practiced cleaning their whole bodies before performing their daily prayer at least five times per day.

In addition, the mean score of stress management was increased from 1.36 (before the program) to 3.69 (after program). It might be explained that practicing of simple technique, such as breathing exercise can improve self-care practice on stress management of diabetes. The result of this study was congruent with the result of Surwit (2002), who recommended breathing exercise for stress management. Similarly, the study of Mercola (2002) also identified that simple breathing exercise improved self-care practices in Type 2 diabetes.

Effect of the supportive-developmental nursing program

The effectiveness of the program was evaluated by change in self-care practices. Supportive-developmental nursing program had an effect on the self-care practices in the experimental group which found increased scores of the Diabetes self-care practices as compared to the control group.

The results of this study showed that after Type 2 diabetes patients in the experimental group received the usual care coupled with the supportive-developmental nursing program, the mean scores of their self-care practices on dietary control, exercise, medication taking, stress management, and personal hygiene were significantly higher than those in the control group who received only the usual care ($p < .01$) (Table 3). The

findings indicated that a supportive–developmental nursing program improved all relevant aspects of self–care practices among the Type 2 diabetes patients.

The results in Table 4 showed that the post–tested total self–care practices score of the experimental group was higher than the control group ($p < .01$). Based on their post–test subtotal self–care practice scores in Table 5, the findings revealed that the Type 2 diabetes patients who were provided with the supportive–developmental nursing program had performed better self–care practice in all aspects, i.e., dietary control, exercise, medication taking, stress management, and personal hygiene. The changes in self–care practices reflected by the subtotal self–care practice scores might be influenced by a number of factors such as motivation, self–care capability, and a supportive environment (Orem, 2001). Through the assistance of methods in the designed nursing program, the nurses were able to motivate the patients to develop their self–care capability. A gradual increase and development of self–care skills and practices could be achieved through teaching, guiding, supporting, and providing an encouraging environment within three visits.

For the experimental group, the supportive–developmental nursing program was able to encourage Type 2 diabetes patients to perform better in utilizing self–care practices. The significant effect on self–care practices after attending this program could be explained by the methods of assistance provided by the researcher who was acting as a nurse when delivering the program. The researcher used five methods of assistance: teaching, guiding, supporting, and providing a conducive environment in the arrangement of nursing activities for promoting the capabilities of self–care for Type 2 diabetes patients and facilitating them to perform self–care practices themselves. According to Orem (2001), these helpful methods were tools in assisting patients to increase their capabilities in engaging in the operating processes of their deliberate actions.

Persons with Type 2 diabetes are normally adults. According to Knowles (1987), adults need self–directed learning activities in daily life since they already have acquired a high degree of knowledge, skills, and experience. The results of this study are in agreement with the results of Folden (1993) who found beneficial effects from an intervention of a supportive–developmental nursing program for patients who had strokes. Folden found that the patients were able to increase their capability to engage in self–care practices. Similarly, studies of Jaarsma et al. (1999) and Jaarsma, Abu–Saad, Dracup, and Halfen (2000), revealed that patients with heart failure who received a supportive–educative approach which promoted individual self–care practice were able to achieve better self–care.

Therefore, Jaarsma et al suggested that the improved understanding of Type 2 diabetes patients and their self-management of the disease through helpful methods were an essential role in helping the patients to perform their own self-care practice.

A supportive-developmental nursing program included teaching, guiding, supporting, and providing a conducive environment to ensure that patients were able to obtain information and knowledge. During the teaching phase, the researcher spent 10 minutes in welcoming and assuring the Type 2 diabetes patients that the program was very practical and applicable in helping them to perform self-care practices. In the process of establishing a relationship, the researcher expressed herself in friendly manner, smiling, and talking softly, in order to encourage the patient to pay attention during the conversation. Thus, establishing a warm nurse-patient relationship helped persons with Type 2 diabetes to sufficiently respond and develop the capability for self-care practices (Orem, 2001). According to Gagliadino (2001), relationship between patients and healthcare provider allowed for peer interaction and instilled a sense of competition management diabetes and decreased the development of complications related to Type 2 diabetes.

Teaching Type 2 diabetes individuals entailed providing information and knowledge on how to promote self-care practices. According to Donaldson et al. (2000), providing patients with the information enabled the patients to make informed choices about their self-care practices with confidence. The accurate perception of the illness which patients acquired during the teaching session in the program can enrich their knowledge. Orem (2001) stated that adequate knowledge was necessary to perform appropriate self-care practices. When the patients had interaction with the researcher and gained appropriate information related to the illness, their self-care was likely to increase (Smeltzer and Bare, 2004). Thus, integrating information into self-care practice was important for promoting diabetes management (Patterson, Thorne & Devis, 1998).

Eventually, most of the Type 2 diabetes persons who were involved in the teaching sessions gained knowledge about diabetes. According to Hergenbahn (1993), when patients received knowledge about their disease, they would be able to perform better self care practices. Evidence of this study found that the majority of the patients who were involved in the teaching program asked many questions such as 'whether diabetes can be cured?' and 'why did they get diabetes?' In addition, during group discussion, the researcher asked patients who had personal questions to meet with the researcher for

individual consultation after the teaching session and the researcher provided other methods of help, especially guidance and support.

The second step was guiding which was a method to deliver help to the Type 2 diabetes patients in order for them to make decision in their own self-care practices. This finding was similar with the study of (Keeratiyutawong, 1994 & Plodnaimuang, 1999). Providing guiding techniques were used to promote behavior effectively. During the guiding process, patients were encouraged to ask questions. The researcher explained alternatives for each question. By giving alternative answers, the researcher hoped that patients would depend not only on one solution to solve their problems. Orem (2001) stated that guiding was valid to the situation in which person must make choices by themselves, under the nurse's instruction which was frequently used together with the supportive method.

Providing support helps in fostering a person's confidence to continuously perform self-care activities. According to Gregory et al. (1998), providing support was able to reduce anxiety and uncertainty on diabetes problems. In this context, listening to the person's feelings and touching their hands were examples of ways to support or empower patients (Thorsteinson, 2001). The researcher also gave positive support, such as praising the patients for their efforts and encouraging them to continue the practices that they were doing.

The nurse should ensured environmental conditions that motivate the person being helped to establish competence in self-care. An air-conditioned room with comfortable chairs and refreshment were provided. A conducive environment was helpful in facilitating the interrelationship between the nurse and person with Type 2 diabetes. The interaction helped the patients in responding to their self-care demands. In addition, a helpful method foster patients interaction creating a comfortable ambience to talk and discuss their problems.

In addition, during group discussions of self-care practice, topics discussed were dietary control, exercise, medication taking, stress management, and personal hygiene. Details of discussion for each aspect of self-care practices included the following:

Dietary control. For the discussion of dietary practice, meal planning was demonstrated based on the manual handbook used in the program (Epidemiology unit of health department, Ministry of Health, 2004). The understanding of diet was reinforced in all aspects such as portions to be taken, and the types of food to be eaten during meal. Patients were encouraged to adjust themselves as to what they could-or could not take. The

majority of the subjects thought that if they did not eat the dessert, it meant that they were controlling their diets.

Exercise. During the discussion on exercise, the majority of the subjects reported that they did not know which type of exercise would be appropriate for them. Many subjects presented that their friends and families advised them to jog; however, some of them had to stop the activity due to joint pain. In addition, during the group discussion, the researcher showed some pictures on how to do foot exercises, demonstrated simple foot exercises to the patients and encouraged them to follow the demonstration, which was based on the manual handbook.

Medication taking. Before entering the program, the majority of the subjects took medication as prescribed; however, they ignored drugs complications and some of them did not even know the names of the drugs. In the course of the program, patients told the researcher about their history of medication taking, and asked more about medication and its complications. They were concerned and wished to know more about different types of drugs. Therefore, the results in Table 4 showed that at the end of the program, the post-test score of self-care practice on medication taking was higher than the pre-test score.

Stress management. The subjects had the opportunity to discuss their problems and share experiences with other members of their group and with the researcher. They were very interested in discussing the effects of stress on their glucose level. They wanted to know how to control their glucose levels and also how to avoid. In order to control the stress, the researcher suggested doing some simple exercises such as deep breathing exercise, walking, and jogging.

Personal hygiene. This was a very important activity to a Type 2 diabetes patients. The majority of patients reported that they were very concerned about this aspects of self-care practice; however, they did not realized the importance of oral care. During the discussion on personal hygiene, the researcher discussed the risk of periodontal disease among Type 2 diabetes patients. After entering the program, they showed more concern towards oral care.

In contrast to the experimental group, the control group achieved the highest score in self-care practice in both the pre-test and post-test for personal hygiene, however, no change in personal hygiene behavior was shown at the post-test. The results of the post-test for medication taking showed a slight reduction and dietary control showed a very slight increase. There was no improvement to the amount of exercise at the post-test. The

pattern of the subtotal self-care practice scores in the control group could be explained by the difficulties on management of Type 2 diabetes encountered by the patients in the areas of dietary control, exercise, and medication taking, which are similar to that reported by American Diabetes Association (2000). Other studies by Glasgow, Hampson, Stryker and Ruggiero (1997), and Sullivan and Joseph (1998) also identified that the greatest difficulties on diabetes self-management were dietary control, exercise, and medication. Thus, the results of the study, together with research conducted elsewhere, confirmed that information about good dietary control and regular exercise were important to Type 2 diabetes persons in order to help them increase their self-care practices. Moreover, according to Tu, McDaniel, and Gay (1993), older adults with diabetes experienced greater barriers in practicing self-care activities necessary for controlling of the disease. It was similar to the study by Mercola (2002), who found that the motivation towards stress management was decreased in uncontrolled diabetes, the persons realized that stress attributed to diabetes and the significance of stress management was on controlling the disease (Hutman, Jaffe, Segal, & Dumke, 2005).

On the other hand, those patients in the control group who had received only the usual care showed no increase in the total and subtotal scores at post-test. This scenario happened because the common practice with Type 2 diabetes patients were to have the doctor informed them during the short time of visiting hours about the detrimental aspects of diabetes when their glucose level was high based on diabetes guidelines. The limitation of information provided and possibly the limited time hinder the doctor and nurses to discuss further about controlling the disease, its causes and risk factors, signs and symptoms, and self-care practice in the management of diabetes.

In addition, the limitation of bringing information provided into practice might also be due to the patient's low educational level. More than half of the subjects in both groups had finished only secondary school; thus, there could be positive relation between educational level and self-care practice. According to Pender (1996), the higher the educational level of the patient, the more accessible the ways to search for additional information, the more experiences in self-care practice, and the greater the understanding about health status than for the less educated patients. Moreover, Orem (2001) stated that education has helped individuals to develop their knowledge, skills, and a positive toward self-care. The educational level increased the understanding about one's health condition and treatment, hence, supporting individual performance in self-care practice.

Therefore, patients with lower levels of education were unable to increase their own capabilities that contribute to appropriate self-care practices.

In summary, the findings generated practical knowledge essential in nursing practice. The implications of helpful methods within the supportive-developmental nursing program would enable nurses to promote self-care capabilities for disease management in the persons with Type 2 diabetes. In addition, although the handbook developed by the Malaysian Ministry of Health had contributed to the program, more information on how to manage stress and dental care is required.

In conclusion, the effects of a supportive-developmental nursing program on self-care practices in this study supported Orem's assertion that the development of the patient's capability is certainly required nurses to involve themselves through helpful methods in the management of diabetes. A supportive-developmental nursing program is able to foster self-care practices among patients with Type 2 diabetes. Hence, a supportive-developmental nursing program is important in developing the patients to be agents of their own care by having both the nurses and patients cooperating to achieve self-care management.