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Family Involvement Programmes on the Metabolic Response of Diabetic Patients

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Abstract

Diabetes is one incurable chronic disease, yet may be controlled through the compliance of diabetic management. This condition may distress the patients. Various efforts have already been made to improve the diabetic patients' compliance through self-care management and diabetic self-management. However, those efforts do not involve family. Thus, efforts involving families in the management of diabetic patients are greatly necessary. The efforts may be conducted by creating a model of family empowerment. The research is conducted with a quasi-experiment pre post-test with control group design on each of 15 respondents. In both intervention and control group are given education on diabetic diet, physical activities for the diabetic patients, drugs and stress management. In the intervention group, the education is then structurally continued involving families every week for a month. In the next three months, the blood glucose and glycated hemoglobin (HbA1c) level are measured. The data are analyzed using paired and independent t-test. The research results show that the majority of respondents in both groups are at the middle of adult age with the gender of female (60.0%) in the intervention group and (53.3%) in the control group, senior high school education level (46.7%) in the intervention group and (33.3%) in the control group, occupation as housewives (40.0%) in the intervention group and (33.3%) in the control group, length of treatment duration in both groups is at the average of 3 years. This research proves that family involvement on diabetes management may lower the blood glucose level ($p=0.000$) and HbA1c level ($p=0.000$) of those diabetic patients.

Keywords: Empowerment; Family; Blood glucose; Diabetes; Glycated hemoglobin

Introduction

Diabetes is one uncured chronic disease, yet may be controlled. This controlling effort requires the patients' compliance. It may distress the patients. However, many patients have poor compliance. Based on a research, the non-compliance average of the diabetic patients includes on diet which is not appropriate to the food planning by 35-75%, inappropriate insulin use by 20-80%, inaccuracy in recording and checking the blood glucose by 30-70%, poor foot care by 23- 52% and non-compliance to the physical exercise by 70-81% [1].

Compliance is closely related to complication and blood glucose control. It means that if the compliance is good then the complication risk may decrease and the blood glucose control may also become good. One effort to improve compliance is by involving the family. Diabetic patients require support in managing their disease. Diabetes requires an individual to have support improvement [2]. Family support is significantly related to the functional status, in which the body function may improve better with the adequate supports [3] or diabetes health status and self-care improvement [4].

Family support is related to self-care. Furthermore, Belgrave et al. [5] stated that family support is significantly related to the positive health behaviors by complying the health activities [5]. The cross-sectional study on 95 adult Hispanic patients who require insulin explores the family support and diabetes self-management. The results show that the participants are only slightly satisfied with the assistance they have already received for self-care, personal care and financial assistance, yet the family support is strongly not related to self-management [4].

Family support has a simultaneously positive influence on the psychosocial health. Thus, health care intervention should involve the family support. White et al. shows that the greater the family support is accepted then the better the psychosocial adaptation to disease may become [6].

However, the phenomena show that the family feels that taking care the family members with diabetes may become a

burden, not only physical but also psychic and emotional. The phenomena taking place in the hospital show that the patients expressed their sadness and surprised since their husband/wife care no more because of feeling bored. One study explains that a negative support given by the family is the strongest predictor due to the worsening stress and disease status [7]. The other study mentions that patients with non-supportive family for the diabetes may have the chances of 10,925 times to have poor blood glucose level [8].

Due to the significant influence of family support on health status of diabetic patients, the efforts to improve the family support are considered necessary. The purpose of this research is to figure out the influence of family empowerment model on the metabolic control of diabetic patients.

Method

The design of this research is a quasi-experimental pre-posttest control group design. Family empowerment model is implemented to the respondents who are divided into control and intervention group. The research samples are the diabetic patients at the age of 40-60 years old, having length of suffering period 5-10 years, are able to read and write, graduating from Senior high school education level and even Higher education, not yet experience complications (stroke, kidney failure and heart failure). Exclusion criteria: widow/widower, patients do not live with the family. The research samples are 30 patients who are equally divided into intervention group (15 respondents) and control group (15 respondents). The scheme is completely described in **Figure 1**.

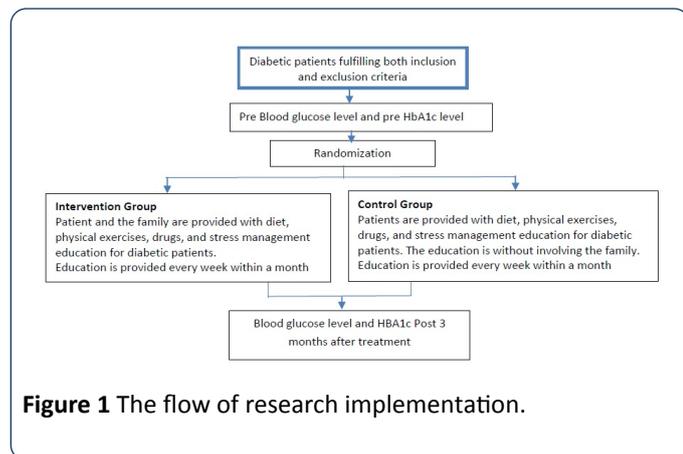


Figure 1 The flow of research implementation.

Results

The research results include the respondents' characteristics (age, sex, education level, and occupation) as well as blood glucose and HbA1c level (**Tables 1-3**).

Table 1 Respondents' characteristics (age, gender, education level, occupation).

Characteristic	Intervention group (N=15) n (%) or mean ± SD	Control Group (N=15)	p value
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		n (%) or mean ± SD	
Sex			
Male	6 (40%)	7 (46.7%)	0.526
Female	9 (60%)	8 (53.3%)	
Education level			
Senior High School	12 (80%)	12 (80%)	1
Higher Education	3 (20%)	3 (20%)	
Occupation			
Housewife	6 (40%)	5 (33.3%)	0.135
Labor	2 (13.3%)	2 (13.3%)	
Civil Servant	1 (6.7%)	0 (0%)	
Retired person	2 (13.3%)	1 (6.7%)	
Entrepreneur	3 (20%)	3 (20.0%)	
Employee	1 (6.7%)	4 (26.7%)	
Anti-diabetic drug consumption			
Metformin	5 (33.33%)	4 (26.67)	1
Sulfonilurea	1 (6.67%)	1 (6.67)	
Metformin+Sulfonilurea	9 (60%)	10 (66.66)	
Age	53.9 ± 4.5	51.9 ± 6.1	0.265
BMI (kg/m ²)	24.7 ± 5.6	23.9 ± 4.4	0.339

Table 2 Mean differences of blood glucose and HbA1c level before and after treatment in the intervention and control group.

Respondent		Mean	SD	N	p value	
Intervention group						
Blood Level	Glucose	Pre	277.46	39	15	0
		Post	200.86	36.78		
HbA1c		Pre	10.13	0.639	15	0.04
		Post	8.37	0.95		
Control group						
Blood Level	Glucose	Pre	244.86	46	15	0
		Post	224.93	54.56		
HbA1c		Pre	9.47	1.06	15	0.002
		Post	9	1.05		

Table 3 Decrease differences of blood glucose and HbA1c level between those in the intervention and control group.

Respondent	Mean	SD	n	p value
Blood Glucose Level	-75.4	37.81	15	0
of Intervention Group	-19.53	33.44		

Blood glucose level of control group				
HbA1c of Intervention Group	-1.77	0.7	15	0
HbA1c of Control Group	-0.47	0.48		

Discussion

The research results show that family empowerment influences the blood glucose and HbA1c level. This empowerment model involves families in the diabetic management. Families are directly involved in assisting the diabetic patients, starting from providing information, emotional, award, instrumental and network support.

Family involvement in diabetic treatment management may improve body health and create positive impacts [6]. The diabetic patients may obtain positive feelings and experiences that life may steadily go on when supported by the surrounding environment. The existence of a model which provides examples of healthy life style, behavior reinforcement, encouragement and meaningful people influence are factors coming from the external environment which may influence health.

Furthermore, the family involvement in handling the diabetic patients may protect them from the negative impacts caused by the disease and the required treatment [9]. Those negative impacts may become stressful conditions for the diabetic people. Physiologically, when someone is in a stressful condition, amygdala sends information to locus coeruleus triggering the autonomous system and then transmitted to the hypothalamus which results in CRF secretion. Regarding to the blood glucose level, as the response to CRF, the pituitary anterior secretes adrenocorticotrophic hormone (ACTH) in blood. ACTH is transported to the adrenal glands. ACTH stimulates the cortisol production in the adrenal cortex. Cortisol is secreted in the bloodstream. Cortisol may influence the blood glucose level increase through gluconeogenesis, protein and fatty catabolism. In addition, cortisol may also inhibit the glucose uptake by the body cells that cortisol may influence the blood glucose level [10,11].

Adequate family support positively influences catecholamines and the oxytocin-suppressed salivary cortisol level which may cause the decrease of glucose level [12]. When the blood glucose control is good, the HbA1c level may be decreased. Schafer et al. revealed that the supportive and non-supportive behaviors of the family members related to the metabolic compliance and control on the diabetic individuals. They conclude that individuals with higher non-supportive family behavior level have lower compliance and poor metabolic control [13].

Conclusion and Recommendation

Family involvement plays a crucial role in self-management compliance and metabolic control. This findings of this study

suggested that participation of family would be important aspect of diabetes care.

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