

## The Influence of Family-Centered Nursing and Spiritual Therapies on Self-Management and Glycated Hemoglobin A

Arwani<sup>1</sup>, Hardhono Susanto<sup>2</sup>, Dian Ratna Sawitri<sup>2</sup>, Ahmad Rofiq<sup>3</sup>,  
Khristophorus Heri Nugroho Hario Seno<sup>2</sup>, Bagoes Widjanarko<sup>2</sup>, Erna Erawati<sup>1\*</sup>

1. Poltekkes Kemenkes Semarang, Semarang, Indonesia.
2. Universitas Diponegoro, Semarang, Indonesia.
3. Universitas Islam Negeri Walisongo, Semarang, Indonesia.

### Abstract

The risk factor of elevated glycated hemoglobin could result microvasculer and macrovasculer complication among the patients with type 2 diabetes. Glycated Hemoglobin A level is strongly influenced by patients self-management.

This study aimed to investigate the effect of family-centered nursing and spiritual therapies on self-management and Glycated Hemoglobin A.

A quasi-experimental study using a control group conducted in 60 samples that were divided into three groups. The group who received family-centered nursing and spiritual therapies in group 1, family-centered nursing only in group 2, and standard treatment in group 3. Self-management questionnaire and Glycated Hemoglobin A level were measured in the three groups before intervention as a baseline data, and 3 months after intervention. Data was analyzed by using repeated ANOVA and path analysis.

The result revealed that there was a significant difference in self-management in grup 1 compared with grup 2 and 3, but there was no significant difference in Glycated Hemoglobin A in all group. Intention only as a part of self-management had a significant influence on behavior ( $p < 0.001$ ), as well as diabetes self-management behavior on the level of Glycated Hemoglobin A ( $p = 0,020$ ).

**Clinical article (J Int Dent Med Res 2020; 13(3): 1234-1238)**

**Keywords:** Family-centered nursing, Spiritual therapies, Self-management, Glycated Hemoglobin A.

**Received date:** 13 May 2020

**Accept date:** 20 July 2020

### Introduction

It is estimated that in 2035 around 14.1 million people will be affected by Diabetes Mellitus.<sup>1</sup> Unhealthy behavior has the greatest influence on the morbidity of type 2 diabetes mellitus,<sup>2</sup> and it contributes to diabetic complication in major cases.<sup>3</sup> However, most of type 2 diabetes mellitus are preventable by healthy behavior.<sup>4</sup> Many studies showed that patients with type 2 diabetes mellitus who regularly control glucose level will decrease more than 78% of micro-vascular and macro-vascular complications.<sup>5-6</sup> Glycaemic control is also strongly influenced by self management.

Self management will reduce the complications incidence that often occur in patients with diabetes mellitus.<sup>7</sup> Some studies show that diabetes self-management has a positive impact on Glycated Hemoglobin A levels after 3 months intervention.<sup>8-9</sup> The adherence to medication become important factor in glycaemic control<sup>10-11</sup> as well as the duration of diabetes and family support.<sup>11-12</sup>

Family support has a significant influence on patient's adherence to the treatment. Family's support bring positive impacts on diabetes management.<sup>11-12</sup> Thus, family empowerment can be implemented through family-centered nursing. Family-centered nursing is the process of all family members participation in managing health problems experienced by family members.<sup>13</sup>

Health behavior and belief could improve compliance on diabetic treatment. Spirituality is an unique aspect that is owned by each individual regardless of beliefs or religion

#### \*Corresponding author:

Erna Erawati, SKep, Ns, MKep  
Poltekkes Kemenkes Semarang, Semarang, Indonesia.  
E-mail: [ernaerawati57@yahoo.com](mailto:ernaerawati57@yahoo.com)

adopted. A research showed that spiritual therapies had a positive impact on individual's intention to behave a certain behavior<sup>14</sup>, reduce negative activities<sup>15-16</sup> and improve lifestyle habits.<sup>17</sup>

This study aimed to investigate the effect of family-centered nursing and spiritual therapies on self-management and Glycated Hemoglobin A level in type 2 diabetes patients.

### Materials and methods

A quasi-experimental design using control group was conducted in three groups invited consisting of group 1 who received family-centered nursing and spiritual therapies; group 2 who only received family-centered nursing; and group 3 who only received health education. The sample in each group was 20 persons with type 2 diabetes mellitus. Self management as dependent variable consisted of diabetes self-management level, level of intention, subjective norms, perceived behavioral control, knowledge of diabetes mellitus. Glycated Hemoglobin A level as indicator of control glycaemic in the groups were measured before intervention as baseline data and were measured in 3 months after intervention.

Analysis data was conducted to determine the effect of intervention on diabetes self-management using repeated measures ANOVA, and to determine the effect of the intervention on Glycated Hemoglobin A levels through intention and diabetes self management using path analysis. To test the amount of the contribution shown by the path coefficient on each path diagram of the causal relationship between several independent variables with intermediate variables and their impact on the dependent variable.

### Results

Patients with type-2 diabetes mellitus in this study were 17.9 years old on average. Socio-demographic characteristics are summarized in table 1.

Changes in self management that consisted of subjective norm, perceived behavioral control, knowledge, intention of diabetic self management, diabetic self management behavior and Glycated Hemoglobin A of patients with type-2 diabetes mellitus were

analyzed using repeated ANOVA (see table 2).

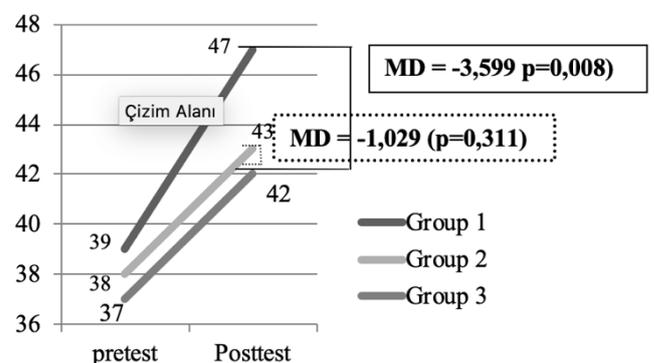
Variables	Group 1		Group 2		Group 3		P Value
	Mean	SD	Mean	SD	Mean	SD	
Age	55.9	8.7	55.8	9.9	58.4	9.6	.62
Body Mass Index (BMI)	16.4	4.3	25.8	3.3	26.7	4.3	.38
Hemoglobin Level	13.5	1.1	13.7	0.9	13.4	.9	.69
	N	%	N	%	N	%	
Gender							.86
Male	7	35	4	20	8	40	
Female	13	65	16	80	12	60	
Education							.81
No School	0	0	2	10	0	0	
Elementary School	3	15	6	30	13	65	
Junior High School	4	20	4	20	4	20	
Senior High School	12	60	8	40	2	10	
University	1	5	0	0	1	5	

**Table 1.** The Socio-demographic of Patients With Type 2 Diabetes Mellitus (N=60).

Variables	Group 1 (n=20)				Group 2 (n=20)				Group 3 (n=20)				P Value
	Pretest		Posttest		Pretest		Posttest		Pretest		Posttest		
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Subjective norm	16.9	2.3	17.9	2.2	16.7	2.1	17.6	1.1	16.8	1.8	17.3	1.0	.38
Perceived behavioral control	10.2	1.1	12.3	1.8	10.8	1.9	11.6	0.6	10.2	1.4	10.8	0.5	.001
Knowledge	4.1	1.3	5.9	1.2	3.9	1.7	4.9	0.8	3.8	1.1	4.1	1.0	.001
Intention of diabetic self management	34.5	2.0	40.1	2.9	34.3	3.6	37.1	2.7	34.4	2.6	35.4	2.0	.001
diabetic self management behavior	37.8	4.5	50.5	5.8	37.7	3.8	43.3	4.9	37.8	3.2	39.1	3.9	.001
Glycated Hemoglobin A	8.2	1.8	6.6	.61	7.7	1.5	7.8	1.4	8.8	2.3	8.5	2.3	.008

**Table 2.** The Difference Score of Subjective Norm, Perceived Behavioral Control, Knowledge, Intention of Diabetic Self Management, Diabetic Self Management Behavior and Glycated Hemoglobin A.

The effect of intervention on self management behavior in covariates appear in the model are evaluated at the following values: p\_post3 = 5.00, n\_post3 = 17.58, k\_post3 = 11.52, i\_post3 = 37.50 (see figure 1).



**Figure 1.** Effect of intervention on behavior of self-management.

Covariates appearing in the model are evaluated at the following values: p\_post3 = 5.00, n\_post3 = 17.58, k\_post3 = 11.52, i\_post3 = 37.50.

Based on figure 1, the study showed that there is a significant increase on self management for patients with type-2 diabetes mellitus after the family-centered nursing and spiritual therapies, whereas family-centered nursing group itself has no a significant effect on self management. The findings also showed that the family-centered nursing and spiritual therapies has no significant effect on Glycated Hemoglobin A level. Diabetes self-management behavior in group 1 had the highest score compared to group 2 and 3, and was statistically significant. This illustrates that the intervention of family-centered nursing and spiritual therapies can improve behavior of diabetic self management among patients with type 2 diabetes mellitus ( $40.10 \pm 2.954$  compared to  $37.05 \pm 2.762$  and  $35.35 \pm 2.007$ ). The results showed that the mean score of intention in the group 1 experienced a higher increase after the intervention (score 34.5 to 40.1) compared to the group 2 (score 34.3 to 37.1) and group 3 (score 34.4 to 35.4). The effect of intervention on diabetic self management of patients with type-2 diabetes mellitus were analyzed using repeated ANOVA (see table 3).

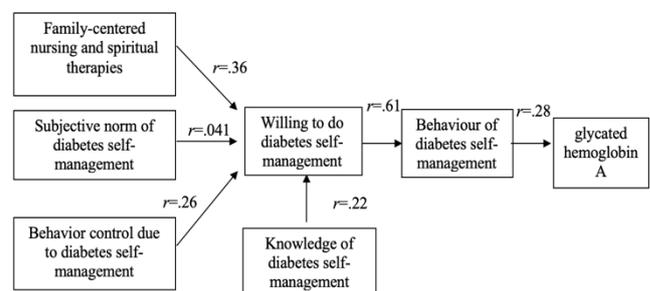
Groups	Mean Difference	SE	P value	Interval Difference for		
				Lower Bound	Upper Bound	
1	2	2.57	1.06	.01	.44	4.69
	3	3.59	1.29	.00	1.00	6.19
2	1	-2.57	1.08	.01	-4.69	-.44
	3	1.02	1.00	.31	-0.99	3.04
3	1	-3.59	1.29	.00	-6.19	-1.00
	2	-1.02	1.00	.31	-3.04	.99

**Table 3.** Effect of Intervention on Self Management.

Dependent variables	Independent variables	B	CI 95%		P Value
			Lower limit	Upper limit	
<b>Direct effect</b>					
Glycated Hemoglobin A level	Self management	-.28	-.51	.04	.02
Self management	Intention of diabetic self management	.61	.45	.76	.001
<b>Indirect effect</b>					
Control glycemic	Intention of diabetic self management	-.10	-.13	-.06	.001
	Perceived behavioral control	-.06	-.15	.02	.136
	Knowledge	-.05	-0.137	.02	.170
	Intervention	-.14	-0.312	.02	.091
	Subject norm	.00	-0.038	.05	.718
Self management	Intervention	.80	0.429	3.17	.01

**Table 4.** Path analysis of factors associated with self management and glycated hemoglobin A in the patients with type 2 diabetes mellitus.

Based on table 4, it is known that by direct relationship, self-management has a negative effect on glycated hemoglobin A levels. Every 1 increase in self-management score, will significantly reduce the glycated hemoglobin A level by 0.28 ( $p = 0.020$ ). Likewise, the intention to do self-management, the direct relationship has a positive effect on self management. Each increasing of 1 intention score for self-management, will significantly increase the self-management score by 0.61 ( $p = 0.020$ ). Visualization of path analysis is presented in Figure 2.



**Figure 2.** Path Analysis.

### Discussion

This research findings showed that the family-centered nursing intervention had no significant effect on self-management scores in patients with type 2 DM. This finding supported by research that conducted by Xu, et al., concluded that family support did not contribute to the self-management of diabetes mellitus in people with type 2 diabetes mellitus. In addition, Xu, et al., stated that family support will actually cause people with type 2 diabetes mellitus to be depressed, especially if family involvement is realized in the form of strict controls or rules. Family involvement will be indirectly influenced by the patient's own belief in performing good self-management.<sup>18</sup>

Another finding of this study showed that intention factor is a sub-variable that has a direct influence on the behavior of self management. Intention is expected to have an influence on the formation of one's behavior to regulate the behavior to be carried out better.<sup>19</sup> The formation of better intentions can be influenced by one's spiritual factors. The results of the study indicate that the individual's intention to take certain actions which is better and in accordance with

health advice is strongly influenced by the intention based on the element of spirituality.<sup>14-16</sup>

Based on the analysis of research data, it is known that family-centered nursing and spiritual therapies has a significant impact on self-management. This results accordance with Fatemeh et al who mentioned that family-centered nursing had a positive influence on the behavior of diabetics to manage blood sugar levels as part of self management.<sup>20</sup> The key behind its improvement was families and patients who have willing to get better through an active interaction with psychiatric nurses. Psychiatric nurses provide a good management of diabetes mellitus include choosing proper food, physical activity, and taking medication regularly.<sup>21</sup>

In this study, the family=ventered nursing was carried out by psychiatric nurses who were one of the family members suffering from type 2 diabetes, through family education activities about DM management including diabetes self-management. Through family-centered nursing activities, psychiatric nurses facilitated caregivers to prioritize and get involved in the supporting and building strength, making plans, choosing the best alternative actions through the empowerment and negotiation process.<sup>22</sup> Several studies have shown that the presence of families, especially couples and adult children in the process of managing diabetes mellitus plays an important role.<sup>20,23</sup>

The result findings also showed that the level of one's spirituality positively influences the individual's intention to perform better behavior. The key behind this improvement is based on individual spiritual level. A good level of individual spirituality will reduce the risk of someone taking actions or behaviors that are detrimental.<sup>15-16</sup>

Diabetes self-management behavior in the group 1 had the highest score compared to the FCC group and the control group, and was statistically significant. The intention factor is possible to be the main predictor variable that causes better changes in behavior of self-management in the group 1. Spiritual therapies in this study was conducted by asking patients with type 2 DM to read and understand the dimensions of spirituality values including values with oneself and others, harmony with nature, and a relationship with a higher power. The activity of reading and understanding meaning correctly will be one of the focus phrases ie words that are of concern for the process of

improving health and positive behavior changes such as optimism to take an action.<sup>24</sup> Spiritual therapies also have an impact on the level of individual health. The results of a study of 1,700 adults who came to church concluded that individuals who diligently attended church had an immune system function based on IL-6 levels and better stress control.<sup>25</sup>

The glycemic control that is shown by the stability of Glycated Hemoglobin A levels in this study was directly affected by diabetes self-management behavior. The results of this study indicate that people with type 2 diabetes mellitus who manage their disease better have a higher chance of stability in blood sugar levels. Behaviour as an aspect of self management is influenced by good intentions. The results of this study indicate that intention in self management has a significantly positive direct effect on behavior of self management of type 2 diabetes mellitus patients. Each increase in 1 intention score in sewill significantly increase behavior self management score by 0.61 ( $p < 0.001$ ). Strong intention will give high enthusiasm to do daily basis with belief that God's grace will come after endeavor.

This study has limitations in the research design used was quasy-experimental research, so no random allocation was made which could affect the process of generalizing results to a larger population.

## Conclusions

Family-centered nursing and spiritual therapies provides a better effect than family-centered nursing on diabetes self-management behavior in people with type 2 diabetes, through the intention to intervene in self-management. The intention in self-management has a significant direct effect on the behavior of self-management. Every increase of 1 intention score in self-management will increase the behavior of self-management score by 0.61. The behavior of self-management has a significant direct effect on glycemic control through glycated hemoglobin A level indicators. Every 1 increase in the behavior of self-management score will reduce the glycated hemoglobin A level by 0.28.

Further research should control all other variables that can affect changes in the dependent variable, such as values and culture, Fe levels, and physical activity, social support,

self-efficacy, diets, and Body Mass Index, and use random allocation techniques (RCTs).

### Acknowledgements

We thank to all respondents who participated in this study.

### Declaration of Interest

The authors report no conflicts of interest pertaining to any of the products or companies discussed in this article.

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