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Relationship between Family Health Tasks and Blood Glucose Levels in Elderly Diabetes Mellitus

Tyas Aulia Hanani [1a], Diah Ratnawati [1b*]

[1] Nursing Profession Study Program, Faculty of Health Science, Universitas Pembangunan Nasional Veteran Jakarta, Indonesia.

[a] Email address: tyashonoka@gmail.com
[b] Email address: ratnawatidiah@yahoo.co.id

Abstract
Elderly as an individual who is at risk of encountering health problems such as diabetes mellitus because the body's functional decline requires a family health task in the form of controlling blood glucose levels that are expected to be able to overcome the problem of diabetes mellitus for the elderly. The objective of this study is to determine the relationship of the implementation of family health tasks with controlling blood glucose levels on the elderly. The research design used was descriptive-analytic with a cross-sectional approach. The population of the families who cared for and lived with elderly suffering from diabetes who are older than 60 years was 136 families, so the researchers determined the sample based on a minimum sample using the Slovin formula. The samples obtained were 102 respondents selected by the stratified random sampling method. The univariate analysis used frequency proportions, and bivariate analysis used the chi-square test. The results of this study indicate that there was a relationship between the implementation of family health tasks with controlling blood glucose levels in the elderly with diabetes mellitus with p-value = 0,000 and OR = 56,893. Based on the results of the study, it was found that the implementation of family health tasks has an important role in controlling blood glucose levels on the elderly with diabetes mellitus. The conclusion of this study was there is a significant relationship between the implementation of family health tasks and controlling blood glucose levels on the elderly with diabetes mellitus in Limo Village, Depok.

Keywords: Blood glucose, family health tasks

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*Corresponding Author:

Diah Ratnawati,
Nursing Profession Study Program, Faculty of Health Science, Universitas Pembangunan Nasional Veteran Jakarta,
Raya Limo Street, Limo Village, Limo Subdistrict, Depok City, Indonesia
Email: ratnawatidiah@yahoo.co.id

1. INTRODUCTION

The success of the government in the development of health sector now causes an increase in life expectancy (UHH). Increased life expectancy (UHH) and the number of elderly population shows an improvement in the quality of health and social community, especially in the elderly . The increase in life expectancy (UHH) in 2017 in Indonesia reaches 70.9 years (Kementerian Kesehatan RI, 2014).

An elderly person is more than 60 years old (Kementerian Kesehatan RI, 2014). Elderly is part of the process of growth and development, humans do not directly grow old, but must go through the stages of development of infants, children, adults, and eventually become old. Someone who is elderly will experience a process of aging biologically, psychologically, and socially at the final stage of his life.

As we get older, a person will experience a decrease in physiological function of the body caused by degenerative diseases so that in the elderly, many experience non-communicable diseases (which is diabetes mellitus). Research conducted by Kekenusa et al., (2013), there is a relationship between age and the case of diabetes mellitus, people with age ≥45 years have an 8 times greater risk of developing type 2 diabetes mellitus compared to people aged less than 45 years.

Non-communicable diseases which are included in the priority health problems one of which is diabetes mellitus, 80% of diabetes mellitus can be prevented by conducting preventive efforts. Black & Hawks (2014) said that diabetes mellitus is a progressive disease caused by the body's inability to metabolize fats, carbohydrates, and proteins, causing hyperglycemia (high blood glucose levels).

The *International of Diabetic Federation* (IDF, 2017) stated that the prevalence of diabetes mellitus in 2017 in the world is 424.9 million adults diagnosed with diabetes and is expected to reach 628.6 million people in 2045. Indonesia is the sixth largest country with diabetes mellitus in the world with 10.3 million people suffering from diabetes mellitus..

The prevalence of diabetes mellitus in Indonesia at the age of ≥ 15 years with diabetes that has been diagnosed by doctors is highest in DKI Jakarta (3.4%) and lowest in NTT (0.9%). Diabetes mellitus is ranked fifth with a percentage (6.84%) as the highest prevalence of causes of death in hospitals in the city of Depok. In the age group 45-75 years, the percentage of outpatient visits reached 24,016 people (22.37%) and inpatients as many as 1,586 people (10.21%) people with diabetes mellitus in Depok City and elderly people with diabetes mellitus at the Limo Grogol Health Center in 2015 around 1196 people (Ratnawati, Siregar, & Wahyudi, 2018).

Increased blood glucose levels (hyperglycemia) is a sign that a person has diabetes mellitus. Controlling blood glucose levels is important to be conducted properly, considering that diabetes mellitus is an incurable disease that can be controlled. The successful control of blood glucose levels is not seperated from the role of community and family nurses (Ratnawati, Siregar, & Wahyudi, 2018). It is in line with the results of a study conducted by Fahra et al., (2017) at Bina Sehat Hospital in Jember with a cross-sectional approach method showing the role of nurses as educators has a significant relationship to self-care type 2 DM patients in poly disease of Bina Sehat Hospital in Jember with the value of correlation is positive.

Elderly with diabetes mellitus requires families in conducting family health tasks. Families have five family health tasks that must be conducted, which are the ability of families to recognize family health problems, the ability of families to make decisions, the ability of families to provide care for sick family members, the ability of families to

modify the environment, and the ability of families to use existing health facilities in the community (Friedman et al., 2010). It is based on the results of research conducted by Yeni & Handayani (2017) in the working area of the Pauh Padang Primary Health Center using a cross sectional approach that stated that the role of the family category is not as good as 48 (53.3%), controlling blood sugar levels in the uncontrolled category of 52 (57.8%), and there is a significant relationship between the role of the family and controlling blood sugar levels in the working area of Pauh Padang Primary Health Center. Diabetes mellitus requires proper management and long-term care, so family involvement is needed to conduct family health tasks so that the elderly obtain health improvement through the care provided.

2. RESEARCH METHOD

The research method used descriptive analytic with cross sectional approach. The population in this study was families caring for and living with elderly with diabetes mellitus and residing in Limo Sub-District, Limo District, Depok City, totaling 136 families. Researchers determined the sample based on a minimum sample using the slovin formula and obtained 102 respondents. The sampling technique of a number of respondents was stratified random sampling in RW 01 to RW 016. The data analysis used was univariate and bivariate. Univariate used frequency distribution, while bivariate used Chi Square. The instruments used in this study are two. The two instruments are a questionnaire and an observation sheet made by researchers based on variable indicators. This study has received ethical approval from the Health Research Ethics Commission, Faculty of Medicine, "Veteran" National Development University of Jakarta with number: B/1982/5/2019/KEPK.

3. RESULTS AND DISCUSSION

Table 1. Frequency of Family Characteristics according to Education, Income, and Number of Family Members in Kelurahan Limo Depok.

Variable		Frequency	Percentage
Education	Low	6	5,9%
	High	96	94,1%
	Total	102	100%
Income	Less	36	35,3%
	Medium	66	64,7%
	Total	102	100%
Number of Family Members	A few	34	33,3%
	Many	68	66,7%
	Total	102	100%

Table 1 shows the frequency of family characteristics based on the education of most families in elderly with diabetes mellitus with high education (senior high-higher school) of 96 families (94.1%) and 6 families in elderly with diabetes mellitus (5.9%) with low education (elementary-junior high school). Based on family income in a month, it showed the results of 66 families in the elderly with diabetes mellitus (64.7%) have enough income and 36 families in the elderly with diabetes mellitus (35.3%) have less income. Based on the number of family members, it obtained results of families with elderly with diabetes mellitus mostly have a number of family members categorized as many, (≥4 people) as many as 68 families (66.7%) and 34 families in elderly with diabetes mellitus (33.3%) who have the number few family members are categorized (<4 people).

Table 2. Frequency of Family Health Task Implementation with Diabetes Mellitus Elderly in Limo Village, Depok.

Variable	Frequency	Percentage
Recognize the problem		
Able	42	41,2%
Not able	60	58,8%
Total	102	100%
Make decision		
Able	40	39,2%
Not able	62	60,8%
Total	102	100%
Take care		
Able	43	42,2%
Not able	59	57,8%
Total	102	100%
Modify the environment		
Able	36	35,3%
Not able	66	64,7%
Total	102	100%
Utilize the health service		
Able	26	25,5%
Not able	76	74,5%
Total	102	100%
Implement the Family Health Task		
Able	41	40,2%
Not able	61	59,8%
Total	102	100%

Table 2 shows the frequency of family health tasks based on the ability of families to recognize problems as many as 60 families in elderly with diabetes mellitus (58.8%) were able to recognize problems, and 42 families in elderly with diabetes mellitus (41.2%) were not able to recognize problems. Family health tasks based on the ability of families to make appropriate health action decisions show the results of 40 families in the elderly with diabetes mellitus (60.8%) able to make decisions and 62 families in the elderly with diabetes mellitus (39.2%) were unable to make decisions.

Family health tasks based on the ability of families to care for sick members showed the results of 59 families in elderly with diabetes mellitus (57.8%) able to treat elderly people with diabetes mellitus and 42 families in elderly with diabetes mellitus (42.2%) unable to treat elderly people with diabetes mellitus. Family health tasks based on the ability of families to modify the right environment show the results of 66 families in elderly with diabetes mellitus (64.7%) able to modify the right environment and 36 families in elderly with diabetes mellitus (35.3%) unable to modify the right environment.

Family health tasks based on the ability of families to use health services showed results as many as 60 families in the elderly with diabetes mellitus (58.8%) were able to take advantage of health services and 42 families in the elderly with diabetes mellitus (41.2%) were unable to utilize health services. The implementation of family health tasks showed the results of 60 families in the elderly with diabetes mellitus (58.8%) able

to implement family health tasks and 42 families in the elderly with diabetes mellitus (41.2%) unable to conduct family health tasks.

Table 3. Frequency of Blood Glucose Levels in Elderly Diabetes Mellitus in Limo Village, Depok.

Variable		Frequency	Percentage
Fasting Blood Glucose Levels	Uncontrolled	29	28,4%
	Controlled	73	71,6%
	Total	102	100%

Table 3 shows the frequency of blood glucose levels in the elderly with diabetes mellitus, which is the elderly who have blood glucose levels with controlled categories (<126 mg/dl) as many as 73 elderly (71.6%) and 29 elderly (28.4%) have blood glucose levels with uncontrolled categories (≥126 mg/dl). Most of the elderly with diabetes mellitus in Limo Village, Depok have well controlled blood glucose levels (<126 mg / dl).

Table 4. Analysis of the Relationship Between Implementing Family Health Tasks in Identifying Problems and Controlling Blood Glucose Levels on Elderly Diabetes Mellitus in Limo Village, Depok.

Implementation of Family Health Tasks	Blood Glucose Level				Total	
	Uncontrolled		Controlled			
	N	%	N	%	N	%
Unable	61	55,0	50	45,0	111	100,0
Able	37	37,8	61	62,2	98	100,0
Total	98	46,9	111	53,1	209	100,0

The results of the analysis in the table above of 102 families show that there were 41 families who are unable to conduct family health tasks with 27 (65.9%) elderly with diabetes mellitus have uncontrolled blood glucose levels, but there were 14 (34.1%) elderly with diabetes mellitus who have controlled blood glucose level. The results also found that 61 families were able to conduct family health tasks with 59 (96.7%) elderly with diabetes mellitus having controlled blood glucose levels. However, there were still 2 (3.3%) elderly with diabetes mellitus who have uncontrolled blood glucose levels.

Family characteristics based on education indicate that most families in the elderly with diabetes mellitus in Limo Village, Depok have further education (senior high-higher school). A good level of education is one of the characteristics of family factors that influence families in understanding the care knowledge of elderly diabetes mellitus obtained. Dahliyani et al., (2015) in his research argued that the higher education a family has, the easier it will be for families absorb and understand the information obtained so that family knowledge related to diabetes mellitus in the elderly will increase. Knowledge held by the family about diabetes mellitus and its treatment will raise awareness and influence family health behavior.

Family characteristics based on family income indicate that most families with elderly diabetes mellitus in Limo Village, Depok have a good enough income (≥UMR). Families who have enough income can change the family's health status and are used to meet the health care needs of family members. Families who earn enough will be able to facilitate the elderly with diabetes mellitus to carry out routine medical check-ups every month in health services, conduct treatment, and fulfillment of nutrition in accordance with the recommended diet for elderly people with diabetes mellitus so that the blood glucose levels in the elderly can be controlled properly. In addition, family

characteristics are based on the number of family members; the majority of families with elderly diabetes mellitus in Limo Village, Depok have many categorized family members (≥4 people) in one house. The number of family members with a lot of categories (≥4 people) in one house can increase family support in elderly with diabetes mellitus in the form of conducting family health tasks properly so that blood glucose levels in the elderly can be controlled. The change in family structure to a smaller family can affect the provide support to family members, especially the elderly. The majority of diabetes mellitus elderly in Limo Village, Depok have a well-controlled blood glucose level (<126 mg/dl). The role of the family in controlling blood glucose levels in patients with diabetes mellitus is very important. The successful control of blood glucose levels does not escape from supervision and monitoring in the management of diabetes mellitus conducted by the family at any time (Waspandji, 2009).

Family health tasks based on the ability of families to recognize the problem, most families with elderly diabetes mellitus in Limo Village, Depok are able to recognize the problem of diabetes mellitus that occurs in the elderly. In line with the results of research conducted by Ratnawati, Wahyudi, & Zetira (2019), the value of p value=0,000 means that there is a relationship between family support and quality of life in people with diabetes mellitus. Kosim (2017) explained that in controlling blood glucose levels, family support is needed. Family support consists of attitudes, family actions, and family acceptance of members who are sick. Family support has 4 dimensions consisting of appreciation support, emotional support, instrumental support, and informative support.

The ability of families to recognize problems as a basis for determining health care actions to be taken by families. Families who are unable to recognize the health problems that occur in family members will find it difficult to cope with and perform health care for members who are sick.

Family health tasks based on the ability of families to make the right health action decisions, most families with elderly diabetes mellitus in Limo Village, Depok are able to make appropriate health action decisions against diabetes mellitus that occurs in the elderly. In line with research conducted by Zulfitri et al., (2012) about the description of the implementation of the family health care function in the work area of the Rumbai Health Center, it shows the results of 345 families (63.8%) being able to make decisions to care for sick members and 196 families (36.2%) unable to make decisions. It is caused by family understanding related to health problems that are happening. Families who are able to recognize health problems that occur in their members will be able to take the attitude or action to overcome these health problems.

Attitude is a predisposition to an action or activity of a behavior. Cognitive aspects (knowledge), affective (assessment of an object), and conactive (action) are components of attitude. Cognitive aspects are very important for the formation of one's actions (over behavior). Family knowledge, cost, energy, and time are the factors behind the taking of health actions taken by the family in dealing with health problems that occur in family members. Decision making of health actions to be performed on members who are sick is the right and responsibility of every member in the family (Friedman et al., 2010).

Family health tasks based on the ability of families to care for members who are sick, most families with elderly diabetes mellitus in Limo Village, Depok are able to treat diabetes mellitus that occurs in the elderly. In line with Yeni & Handayani (2017)

in his research which showed that there is a relationship between the role of the family controlling blood glucose levels in patients with diabetes mellitus in the working area of Pauh Padang Primary Health Center with a p value=0,000. The good role of the family is caused by good family knowledge related to family health care so that blood glucose levels in patients with diabetes mellitus can be controlled.

Friedman et al., (2010) stated the family has a role consisting of formal roles and informal roles. Formal roles such as roles as household regulators, recreation, care of healthy and sick members, provider roles, and sexual roles. The informal role consists of the role of the family caring for its members and providing family support for compliance with treatment. It is because, adherence to treatment is one of the factors associated with controlling blood glucose levels in people with diabetes mellitus when people with diabetes who have low levels of medication adherence will cause poor control of glucose levels (Chua & Chan, 2011).

Family health tasks based on the ability of the family to modify the right environment, most families with elderly diabetes mellitus in Limo Village, Depok are able to modify the right environment for elderly diabetes mellitus. In line with the results of research conducted by Sulistyowati (2012), it showed results p=0.015 and r=0.441, meaning that there is a relationship between the implementation of family health tasks in creating an environment that supports health with schizophrenia recurrence in Paringan Village. Families are able to control the expression of emotions by paying attention to the needs of elderly diabetes mellitus making the elderly feel more valuable.

Families also ask complaints that are felt everyday and also create a safe and comfortable environment. It will cause the elderly with diabetes mellitus to not experience stress and emotional conditions that are stable so that their blood sugar levels are controlled. In accordance with the results of research conducted by Derek et al., (2017), it revealed the relationship between stress levels and blood sugar levels. The elderly prefer to live with family rather than living in nursing homes because the family is the closest person to the elderly. A good environment for the elderly with diabetes mellitus is a clean, comfortable environment that does not cause stress to the elderly.

Likewise, it is important to have the ability of families to create a physical environment so that the elderly can maintain their diet and carry out regular physical activity. The reason is physical activity can affect blood glucose levels by converting glucose into energy. This result is also supported by Ratnawati, Siregar, & Wahyudi, (2018), a healthy lifestyle such as a balanced diet and regular physical activity in the family environment will affect the control of blood glucose levels in the elderly.

Family health tasks based on the ability of families to use health services, most families with elderly people with diabetes mellitus in Limo Village, Depok are able to use health services to control blood glucose levels in elderly people with diabetes mellitus. In line with research conducted by Mukhtaruddin et al., (2014) about the description of family health tasks that have elderly with hypertension, the results obtained are 50 respondents (71.4%) of 70 respondents able to take advantage of existing health services.

Factors that influence the ability of families to use health services include families knowing the existence of existing health facilities and the benefits to be gained from health facilities. Families use health services that are commonly used and tend to choose the closest such as Elderly Health Unit, Primary Health Center, and hospitals (Friedman et al.,2010).

In this study, it was conducted an analysis of the relationship between the implementation of family health tasks with controlling blood glucose levels in elderly

with diabetes mellitus. The results of the Chi Square statistical test, obtained a p-value of 0,000, it can be concluded that the p-value<0.05 so that Ha is accepted, which means that there is a significant relationship between the implementation of family health tasks with controlling blood glucose levels in the elderly with diabetes mellitus. OR (Odds Ratio) test results showed a value of 56.893 which means that families who are unable to carry out family health tasks are at risk 56.893 times for uncontrolled blood glucose levels in the elderly with diabetes mellitus.

The relationship between the implementation of family health tasks with controlling blood glucose levels in elderly with diabetes mellitus occurs because the family has a major role or support in maintaining family health. Improving family health status requires solving health problems that occur in families such as carrying out family health tasks. The results of this study are in line with research conducted by Sulistyowati (2012) showing the results of p=0,000 and r=0,676, meaning that there is a relationship between the implementation of family health tasks with recurrence schizophrenia in Paringan Village.

The family is the main key to healthy members. The function of maintaining family health can affect the lifestyle of its members oriented to health. In accordance with the study of Majid et al., (2017), there is a significant relationship between attitude and blood sugar levels in people with diabetes mellitus. It means that family attitudes in particular in caring will influence health behaviors that families give to people with diabetes mellitus to control blood glucose levels.

Efforts can be made by families to maintain or improve the health status of their members through health care through the implementation of family health tasks. The achievement of family health tasks, families are expected to be able to manage health problems, maintain family functions, and improve community services about health care (Friedman et al.,2010).

Families who are unable to conduct family health tasks with elderly people with diabetes who have controlled blood glucose levels are caused by awareness and independence in conducting the treatment of diabetes mellitus owned by the elderly. This is supported by research by Sam Nur et al (2017) that there is a significant relationship between activity of daily living in patients with diabetes mellitus with blood sugar levels with a p value=0.045.

4.   CONCLUSION

The majority of elderly families with diabetes mellitus in Limo Village, Depok have sufficient income (≥UMR), have a large number of family members (≥ 4 people), and have higher education (senior high-higher school) and have controlled blood glucose levels (≤126 mg/dl). The elderly family of diabetes mellitus in Limo Village, Depok is mostly able to recognize the problem, make appropriate health care decisions, treat, modify the environment, and utilize health services. The conclusion of this research is that there is a significant relationship between the implementation of family health tasks with controlling blood glucose levels in the elderly with diabetes mellitus in Limo Village, Depok.

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