Correlation Between Self-Motivation and Family Support on Stress Levels and Self-Acceptance of Type 2 Diabetes Mellitus Patient

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ABSTRACT
Background: Type 2 Diabetes Mellitus patients often have psychological problems related to burdens and worries about their illness, so they need family support as a support system in dealing with existing worries and emotional burdens. Family support will lead to self-confidence and motivation to deal with their problems. Motivation can come from family support and also from the patient's self-motivation. Motivation from family support and self-motivation is related to the patient's stress level and self-acceptance. **Objectives**: To determine the correlation between self-motivation and family support on stress levels and self-acceptance in type 2 Diabetes patients at Sumbang Banyumas. **Methods**: The analytic observational study with a cross-sectional approach on 49 respondents with type 2 Diabetes Mellitus used the Hensarling Diabetes Family Support Scale Questionnaire, Treatment Self-Regulation Questionnaire, General Health Questionnaire-12, and Berger's Self-Acceptance Scales. Data were analyzed using the gamma correlation test with $\alpha<0.05$. **Results**: The results showed 89.8% were over 45 years old, 83.7% were women, 69.4% were elementary school graduates, 53% were not working, 81.6% had a monthly income below the Regional Minimum Wage, 71.4% had no genetic of Diabetes Mellitus, 34.7% had a long duration of suffering from Diabetes Mellitus < 5 years and 5 - 10 years and 73.5% had good APGAR score, 73.4% had good self-motivation, 69.4% had good family support, 67.3% had mild stress levels and 75.5% had good self-acceptance. There was a significant correlation between self-motivation (p= 0.037) and family support (p= 0.000) on stress levels and there was a significant correlation between self-motivation (p = 0.000) and family support (p = 0.000) on self-acceptance. **Conclusions:** Self-motivation and family support correlate with stress levels and self-acceptance of type 2 Diabetes Mellitus patients at Sumbang Banyumas.

Keywords: *Family support; self-motivation; self- acceptance; stress levels; type 2 diabetes mellitus*

INTRODUCTION

Type 2 diabetes mellitus (Type 2 DM) is a chronic disease that increases blood glucose levels caused by the inability of the body's cells to respond to the insulin hormone produced by pancreatic β cells or insulin resistance[1]. Based International Diabetes Federation (IDF) in 2021, DM patients are around 537 million, and expected to increase to 643 million in 2030. Indonesia is in 5th of the country with the highest number of DM patients in the world with 19.5 million. The prevalence of DM in Central Java continued to increase from 2018 to 2020[3]. DM patients in Banyumas Regency experienced an increase that are 23,858 in 2020 to 25,709 in 2021[4].

Type 2 DM patients need to control blood glucose levels to keep them stable to avoid complications[5]. Control of blood glucose levels is influenced by direct and indirect factors. Indirect factors are often underestimated by patients because their effects are not visible quickly, one of which is psychological problems[6]. Type 2 DM patients often

experience psychological problems related to the burden and worry about their disease. Type 2 DM patients need motivation to overcome existing worries and emotional burdens. Motivation for type 2 DM patients can come from inside such as self-motivation and from outside such as family support.

Self-motivation turns up because of the needs and eagerness inside. The patient's self-motivation will influence the mind which will direct their behavior. Family support is a support system for overcoming worries and emotional burdens[7]. Family support and favorable self-motivation will create a sense of self-confidence to overcome problems it will also have a positive impact on stress levels and self-acceptance in type 2 DM patients[8].

Stress is one of the complicating factors in treating type 2 DM patients. High levels of stress can cause imbalance both physiologically and psychologically. Self-acceptance is a condition where an individual can positively assess himself so he can accept and recognize all of his strengths

and limitations without feeling disgraced or at fault. Stress levels and self-acceptance can influence self-care and blood sugar control in DM patients[9].

METHOD

Samples and Data Collection

This is a cross-sectional study involving a nonrandomized consecutive sample of 49 type 2 DM patients who are willing to be a respondent, have outpatient treatment, have good conscience, and are cooperative, not pregnant or not breastfeeding at Community Health Service 2 Sumbang, Banyumas in November 2022. After the consent was obtained, a self-administered questionnaire was given. The sociodemographic profile was also obtained through the questionnaire.

Data Collection Tools and Instruments

Treatment Self-Regulation Questionnaire (TSRQ)

Treatment Self-Regulation Questionnaire (TSRQ) is a questionnaire used to assess self-motivation developed by Bulter. The questionnaire used is a modified questionnaire from Ariani (2011) with an alpha validity value of 0.839 and a reliability value of r 0.258-0.603 which consists of 19 questions covering 8 questions regarding the reasons for undergoing treatment and blood sugar checks and 11 questions regarding the reasons for complying with eating and exercise rules. Each item can be answered by a four-point Likert scale. Summing the scores in all of the items will determine self-motivation, all of which are positive statements, so that the higher the total score obtained, the more favorable the patient's motivation. A score of < 80% of the total iscore is unfavorable motivation and > 80% of the total score signifies favorable motivation[10].

Hensarling Diabetes Family Support Scale (HDFSS)

Hensarling Diabetes   Family Support Scale is a questionnaire used to assess family support with an alpha validity value of 0.940 and a reliability value of r 0.395-0.85611. This questionnaire consists of 25 positive questions and 4 negative questions, covering 10 questions regarding the emotional dimension, 8 questions regarding the appreciation dimension, 8 questions regarding the instrumental dimension, and 3 questions regarding the information dimension. Each item can be answered by a four-point Likert scale. Summing the scores in all of the items will determine family support. A score of < 58 denotes unfunctional family support and > 56 signifies functional family support[11].

General Health Questionnaire-12 (GHQ-12)

General Health Questionnaire-12 is a questionnaire used to assess stress levels in primary care with a validity value of > 0.196 and a reliability value of r > 0.6012. 0.00 – 0.75. This questionnaire consists of 12 questions assessed using the CGHQ model. Summing the scores in all of the items will determine stress levels. A score of 0,00 – 0,75 is normal, 0.76 – 1.50 for mild stress 1.51 – 2.25 for moderate stress, and 2.26 – 3.00 for severe stress[12].

Berger's Self-Acceptance Scale

Berger's Self-Acceptance Scale is a questionnaire used to assess self-acceptance with a validity value of 0.605 and a reliability value of r 0.75013. This questionnaire consists of 36 questions. Each item can be answered by a four-point Likert scale. Summing the scores in all of the items will determine self-acceptance. A score of 36-90 is unfavorable self-acceptance and 91-144 signifies favorable self-acceptance[13].

Data Analysis

Descriptive statistics was done using frequencies for categorical variables.   The gamma test was used to determine the correlation between self-motivation and family support on stress levels and self-acceptance in type 2 Diabetes patients. For the study, the level of significance was set $\alpha < 0.05$[14].

RESULT

Demographics

A total of 49 type 2 Diabetes Mellitus in Community Health Service Sumbang 2 took part in the study. Table 1 shows Demographics. Most of them have age >45 years old (89,8%), female (83.7%), Elementary school (73,5%), Unemployed (53%), have Below Regional Minimum Wage (81.6%), have no genetics (71.4%), have Length of illness < 5 years (34.7 %) and 5 – 10 years (34.7%)and functional family (73.5%).

Characteristic of Respondents

Table 2 shows the characteristics of respondents. Most of them have favorable self-motivation (73.4%), favorable family support (69.4%), mild stress level (67.3%), and favorable self-acceptance (75.5%).

Table 1. Demographics

Characteristic	Frequency	Percent (%)
Age Group of Respondents		
32-45 years old	5	10,2
>45 years old	44	89,8
Sex		
Male	8	16.3
Female	41	83.7
Educational Background		
Elementary	36	73,5
High School	11	22,5
College	2	4
Occupation		
Unemployed	26	53
Merchant	6	12,3
Cultivator	11	22,5
Private employees	5	10,2
Government employees	1	2
Income		
Above the Regional Minimum Wage	9	18.4
Below is the Regional Minimum Wage	40	81.6
Genetic		
Yes	14	28.6
No	35	71.4
Length of illness		
< 5 years	17	34.7
5 – 10 years	17	34.7
>10 years	15	30.6
APGAR Score		
Highly functional family	36	73.5
Moderately dysfunctional family	11	22.4
Severely dysfunctional family	2	4.1

Table 2. Characteristics of Respondents

Characteristic	Frequency	Percent (%)
Self-Motivation		
Favorable	36	73.4
Unfavorable	13	26.6
Family Support		
Favorable	34	69.4
Unfavorable	15	30.6
Stress Level		
Normal	4	8.2
Mild	33	67.3
Moderate	12	24.5
Self-acceptance		
Favorable	37	75.5
Unfavorable	12	24.5

Bivariate Analysis

The Gamma correlation test analysis obtained an approximate significance value of 0.037 (<p-value 0.05), indicating that there is a significant correlation between self-motivation and stress levels in type 2 DM patients in Sumbang. Based on the results of the analysis, the value r = - 0.600 shows that there is a moderate correlation between self-motivation and stress levels in a negative direction, the higher self-motivation will be the lower stress level. The Gamma correlation test analysis obtained an approximate significance value of 0.000 (p-value <0.05), indicating that there is a significant correlation between family support and stress levels in type 2 DM patients in Sumbang. Based on the analysis results, the value r = - 0.979 shows that there is a very strong correlation between family support and stress levels in a negative direction, the higher the family support will be the lower the stress level.

The Gamma correlation analysis test obtained an approximate significance value of 0.000 (p-value<0.05), indicating that there is a significant correlation between self-motivation and self-acceptance in type 2 DM patients in Sumbang. Based on the results of the analysis, the value

r = 0.922 shows a very strong correlation between self-motivation and self-acceptance in a positive direction, the better self-motivation will be the better self-acceptance. The Gamma correlation analysis test obtained an approximate significance value of 0.000 (p-value <0.05), indicating that there is a significant correlation between family support and self-acceptance in type 2 DM patients in Sumbang. Based on the results of the analysis, the value r = 0.939 shows that there is a very strong correlation between family support and self-acceptance in a positive direction, the better family support will be the better self-acceptance.

DISCUSSION

Demographics

The result of this study, most of the respondents were > 45 years old. The aging process occurs and the anatomical, physiological, and biochemical in the the body have changes that cause the body's metabolism and function of the body's organs to decrease resulting in increased insulin resistance. The older also tend to be less active and have an unbalanced diet, which can trigger insulin resistance[15].

Most of the respondents were female. This result is in line with research conducted by Kabosu et al (2019) which states that females have a 1,749 higher risk of developing type 2 DM compared to males[16]. This is because the percentage of body fat deposits in females is higher which can reduce sensitivity to insulin action in muscles and liver[10].

About the report on educational resources, most of the respondents were in elementary school. The result of this research is in line with research conducted by Anisa and Nugroho (2019) which states that people with low education have a risk of developing type 2 DM of 4,895[17]. Insufficient education influences a person's level of knowledge which influences changes in attitudes and healthy living behavior. Patients who have a low level of education will difficult to receive and understand the health messages, thereby affecting the patient's ability to respond to the problems[9].

Based on the result of occupation, most of the respondents are unemployed and usually do some mild physical activities. Physical activity will affect increasing insulin and increasing the sensitivity of insulin receptors[18].

Most of the respondents have incomes below the regional minimum wage, which causes them to be in lower economic status. These results are in line with research conducted by Pradina and Wahyuni (2021) which states that good economic status will influence preventive management to improve health and the risk of type 2 DM disease decreases[19]. Lower economic status will be associated with low levels of health both physical and emotional and can increase cardiovascular disease and poor glycemic control[20].

With regards to the genetics of DM, most of the respondents did not have it. The result of this study is not in line with research conducted by Yosmar et al (2018) and Imelda (2019) which stated that a genetic of DM has a close relationship with the incidence of type 2 DM. A person with a genetic DM is at higher risk of developing DM. People who do not have a genetic DM can also get type 2 DM, this can be caused by other factors such as age, physical activity, diet, and other comorbidities[21,22].

Most of the respondents had suffered from type 2 DM for < 5 years and 5-10 years. The length of time a patient suffers from type 2 DM can influence their emotional maturity. The longer the respondent suffers from DM, the more familiar the respondent is with DM disease management[23]. Research conducted by Ispriantari and Priasmoro (2017) states that patients who have suffered from DM for more than five years have better acceptance compared to patients who were just diagnosed 24.

Most of the respondents have a functional family with an average APGAR score in the functional category. A functional family will be an important supporting factor for its members in solving physical and mental health problems and improving the quality of life of its members [25]. Research by Mutmainah et al (2016) states that the APGAR score has a significant relationship with the level of depression in type II DM patients in primary health care[26].

Correlation Between Self-Motivation with Stress Levels

The result of this study is in line with research conducted by Suratih et al (2019) which states that there is a relationship between motivation and stress levels in chronic kidney failure patients, in a negative correlation that the better the motivation, the lower the stress level[27]. Nasir and Muthi (2011) explain that the factors that cause high levels of stress are psychological factors, including motivation[28].

Self-motivation is one aspect of emotional intelligence that will have a positive influence on the patient's psychology. Patients who have high self-motivation will tend to have a positive viewpoint in assessing things. On the other hand, patients with low self-motivation will easily dispirited and have maladaptive stress coping strategies, so patients tend to have moderate to severe levels of stress[29].

Adrenocorticotropic hormone (ACTH) increases in stress, it activates the adrenal cortex to secrete glucocorticoid hormones, especially cortisol (hydrocortisone). Cortisol production increases and causes the hormones dopamine and serotonin are decrease which can worsen stress[30].

Type 2 DM patients who have high self-motivation will have an awareness of the importance of controlling the disease. It can be implemented by diet maintenance, exercising, and regularly taking medication. Exercise and diet maintenance, especially high protein can cause an increase in dopamine and serotonin that make patients feel comfortable and improve their feelings by reducing stress levels.

Correlation Between Family Support and Stress Levels

The result of this study is in line with research conducted by Roza et al (2021) which states that there is a significant relationship between family support and stress in type 2 DM elderly patients with a p-value of 0.002 (< 0 .05) at

Sekupang Primary Health Care, Batam[31]. Research by Sholikhah et al (2020) in Nambangan Lor Village, Madiun also shows that there is a significant relationship between family support and stress levels on a diet[32].

Patients with chronic diseases such as type 2 DM need family support to provide encouragement and attention. Type 2 DM patients have to carry out treatment and a diet which can easily become a stressor, so they need help to make it easier for patients to carry out the treatment. Favorable family support will support and help implement the patient's therapy and diet program. The family support provided will help type 2 DM patients feel safe and comfortable, so it can increase motivation to manage the disease. This condition will prevent stress, signs, and symptoms[32].

Functional changes occur in the form of hormonal and neurological in stress, including increased noradrenergic activity and *Corticotropin-Releasing Hormone* (CRH)[33](Sherwood, 2016). CRH will release adrenocorticotropic Hormone (ACTH), which in turn causes the adrenal cortex to release cortisol. Cortisol will also mobilize noradrenaline towards organs[30]. Cortisol will be released into the blood due to activation of the Hypothalamic-Pituitary-Adrenal axis (HPA axis) so dopamine and serotonin also become less.

Family support can have a positive impact on stress levels become lower. Low levels of stress will influence the release of the hormone cortisol released by the HPA to be lower so it has no toxic effect on the hippocampus. The hormones serotonin and dopamine became normal again. Normal levels of dopamine and serotonin will make mood changes to make individuals happier and more comfortable.

Correlation Between Self-Motivation with Self-Acceptance

In this study, the most of respondents had favorable self-motivation. It is a form of a sense of responsibility for the disease. Self-motivation arises because of the patient's awareness of his illness and better[34]. Motivation makes patients try more get stable. In this process, the patient will find out and learn about the disease and will show various responses which are rejection, anger, bargaining, depression, and finally self-acceptance[35].

Self-motivation prevents hopelessness which leads to depression. Depression makes the condition worsen, therefore self-motivation plays a very important role in getting self-acceptance. Patients who have favorable self-acceptance know what and how they are and have the motivation to better[36]. Some respondents had unfavorable motivation but had favorable self-acceptance, this could be cause these respondents had functional family support can lead to gaining favorable self-acceptance[37].

Correlation Between Family Support And Self-Acceptance

This result is in line with research by Loca (2020) which states that there is a relationship between family support and self-acceptance in DM patients in Buduran Sidoarjo Primary Health Care[38]. The result of this research is also in line with research by Laila (2016) which states that there is a positive relationship between social support and self-acceptance, the higher the social support, the higher the patient's self-acceptance[39].

Family support is a relationship process between the family and its social environment that includes information support, appreciation, emotional support, and instrumental support[40]. The family plays an important role in maintaining the health of family members by identifying and making decisions regarding health problems, providing care to sick family members, maintaining a healthy and optimal environment, and being able to access health services in the family environment[41]. Family support can be realized by providing attention, being empathetic, providing encouragement, advice, and knowledge. Family support is related to the formation of mental balance and psychological satisfaction[42].

Family support given to patients can strengthen individuals, create strength, and increase self-appreciation. High support will make patients more successful and resolve their problems compared to those who don't have. Family support has two roles, first is the buffer role that family support buffers the negative effects of anxiety on health, and second is the main role that family support influences health improvement[40].

Family support provided will have an influence or benefit on the individual who receives it. Emotional support is related to one of the factors that influence individual self-acceptance, that is no emotional disturbances in the environment. Without emotional barriers in the environment, Individuals can accept themselves more[42]. Self-acceptance will be characterized by a positive viewpoint towards themselves which ultimately leads to the ability to love themselves and the individual can accept himself as a human being who has advantages and disadvantages. Diabetes mellitus patients will have a more positive attitude towards learning about their disease and participate in health education regarding their disease. On the other hand, diabetes mellitus patients will have a negative attitude if there is a rejection of the patient and without support from the family while undergoing treatment[43].

Study Limitations and Future Research Recommendations

The relative cost and time that required the researchers to carry out this investigation was small using consecutive sampling; it also enabled them to gather useful information that would have not been possible using probability sampling techniques. However, the subjects they used in this study may not have wholly represented the population of DM hence, it limited the ability of this paper to make generalizations about the entire population. It is therefore recommended that a randomized population be generated in a follow-up study to avoid under or over-representation of this particular DM patient.

The cross-sectional study design used in this study found a significant correlation between Self-Motivation and Stress Levels, a significant correlation between family support and Stress Levels, a significant correlation between Self-Motivation and Self-Acceptance and a significant correlation between family support and Self-Acceptance. Still, the study design also limited the ability to establish causality. Future longitudinal studies may better describe the roles of self-motivation and family support during the illness trajectory. Also, this survey is based on self-report and may be prone to social desirability bias. Future studies should assess the factors influencing self-motivation, family support, stress levels, and self-acceptance. A follow-up study using a bigger and more homogeneous population is also recommended

CONCLUSION

Many type 2 DM patients have inadequate resources, especially economic resources, and insufficient education to understand their disease. Many type 2 DM patients also have favorable self-motivation, favorable family support, mild stress levels, and favorable self-acceptance. The community, and families of type 2 DM patients and type 2 DM patients are expected to give more attention to the importance of support, motivation, stress levels, and self-acceptance because they can influence the treatment for type 2 DM patients.

Ethical Approval and Informed Consent
This research has been approved by the research ethics commission of Jenderal Soedirman University on Reff: 008/KEPK/PE/VIII/2022

Availability of Data and Material
Data uses primary data by filling out a questionnaire

Conflicts of Interest
The authors declare that they have no Conflicts of Interest

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