



## Personal Agency Enhancing Model in Prevention of Diabetic Foot Ulcer

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### ABSTRACT

Diabetes mellitus (DM) is an increase in blood sugar levels which can cause complications. Uncontrolled diabetes can cause various complain in patients. Objective: Analyzing the characteristics of respondents with psychosocial, the characteristics of respondents with the personal agency, and psychosocial with the personal agency for the prevention of diabetic foot ulcer. Method: The design used was a cross-sectional study with simple random sampling using psychosocial instruments and the personal agency for diabetic foot ulcer prevention with a total of 329 respondents from the age of 30 to 75. The data were analyzed using SEM-PLS software. Results: 221 patients had no history of diabetes, and most of them had good knowledge, 4 respondents experienced severe stress, mostly with high perceived control (52.3%), low self-efficacy (53.2%), and low personal agency (51.1%). There is no relationship between the characteristics of the respondent and the personal agency. There is no relationship between the psychosocial with the personal agency. There is a relationship between psychosocial with the personal agency for preventing diabetic foot ulcer. Conclusion: The variables of knowledge and stress have a large direct contribution to the improvement of the personal agency for diabetic foot ulcer prevention.

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### INTRODUCTION

Diabetes mellitus is a lethal, degenerative disease. Gorontalo Province ranks 6th in Indonesia in terms of the highest incidence of diabetes. Complications that can be caused by diabetes are uncontrollable and include the eyes, brain, kidneys, blood vessels, and diabetic foot ulcer (Perkeni, 2015). Prevention efforts have often been made to reduce the incidence of diabetic foot ulcer. However, this is not as expected because various things affect the incidence of diabetic foot ulcer, one of them is behavior. Patient behavior, in this case, is an individual personal agency which is one part of the individual that can determine success in behavior. According to Ajzen (2005), personal agency plays an important role for individuals in their behavior. The personal agency consists of perceived control and self-efficacy.

According to Pakaya N. (2020), knowledge is not sufficient to improve patient behavior. Other things such as attitude and personal agency also play a very important role. According to Ajzen I. & Icek (1969), personal agency is related to perceived control and self-efficacy in preventing diabetic foot ulcer. The personal agency can increase if the individual has good knowledge. Likewise, low stress will increase the patient's personal agency in preventing diabetic foot ulcer. This study's objective was to analyze the characteristics of respondents with psychosocial, to analyze the characteristics of respondents with the personal agency, and to analyze psychosocial with the personal agency for the prevention of diabetic foot ulcer.

**MATERIALS AND METHODS**

The design used was a cross-sectional study conducted on 329 diabetic patients who had never experienced diabetic foot ulcer. The study was conducted from January 2nd, 2019, to May 31st, 2019. Patients were selected by simple random

sampling from the age of 30 to 75 years. The variables consist of respondent's characteristics, psychosocial, and personal agency. The study was conducted with an ethical test, and the instrument used was a questionnaire that had been through the validity and reliability tests. The data were analyzed using Sem-PLS analysis.

**RESULTS AND DISCUSSION**

**Table 1.1.Characteristics, knowledge, and stress levels of diabetic patients**

Karakteristik	Classification	Amount	Percentage	Mean ± SD, Min - Max
Age:	24 – 35 Years of Age	1	0,3	Mean: 57.29 SD: 8,88 Min: 35 Max: 84
	36– 45 Years of Age	30	9,1	
	46 – 55 Years of Age	62	18,9	
	56 – 65 Years of Age	213	64,8	
	65 – 75 Years of Age	23	6,9	
Sex:	Male	89	27,1	
	Female	240	72,9	
Occupation:	Unemployed	215	65,3	
	Peasant	61	18,6	
	Entrepreneur/ Honorary	30	9,1	
	Employee	23	7,0	
	PNS/Civil Servant			
Family Record related to Diabetes Mellitus	Have a diabetes record	108	32,8	
	Have no diabetes records	221	67,2	
Knowledge about Diabetes Mellitus	Poor	3	0,9	93,26 ± 10,95 39 - 100
	Fair	32	9,7	
	Good	294	89,4	
Stress Level	Not Stressed	254	77,2	13,64 ± 3,72 9 - 32
	Light	40	12,2	
	Medium	31	9,2	
	Heavy	4	1,4	

Table 1.1 showed that most of the respondents at the age of 56 – 65 years old are female, unemployed, come from families with no diabetes record, have a good knowledge related to diabetes (>75%), and more than 75% of respondents do not experience stress.

Table 1.2 showed that the diabetes patients personal agency are mostly categorized as low. Figure 1.1 shows the loading factor > 0.5 and the T statistic value that is less than 1.96, which means that all indicators are valid and significant.

**Table 1.2 Personal agency of diabetes patients**

Personal agency indicator	Low		High		Mean, SD Min,Max
	Amount	%	Amount	%	
Perceived control	157	47,7	172	52,3	18,89 ± 6,04 7 – 34
Self-efficacy	175	53,2	154	46,8	13,44 ± 1,80 8 – 16
Total of personal agency	168	51,1	161	48,9	32,38 ± 6,08 19 – 46

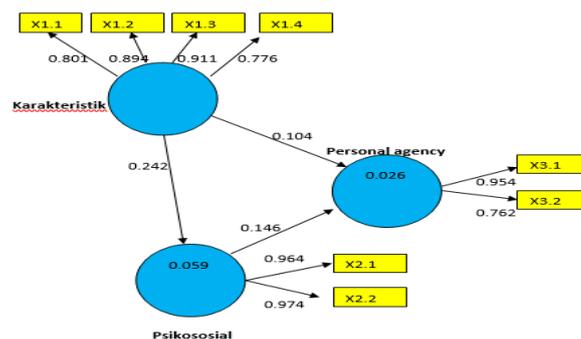


Figure 1.1 SEM Partial Least Square Structural Equation Analysis

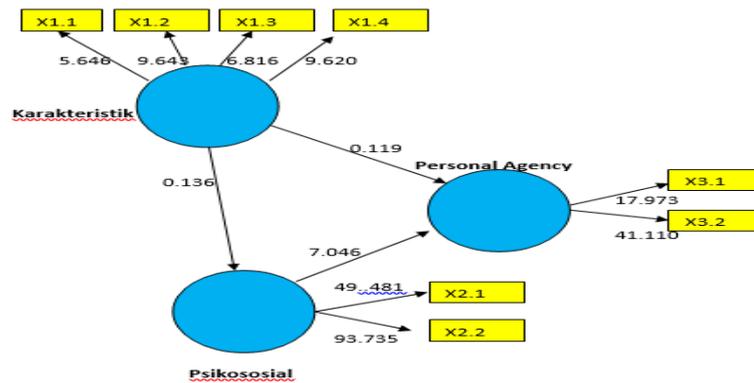


Figure 1.2. T-statistic value in structural model (inner model)

Figure 1.2 Structural Equation Modeling analysis with Path Least Square shows that there is no relationship between characteristics and psychosocial, (0.13), there is no characteristic relationship with the personal agency (0.11), there is a relationship between psychosocial with the personal agency (7,04)

#### The relationship between characteristics with psychosocial diabetic foot ulcer incidence

Table 1.1 shows that the diabetes patients in Gorontalo City are mostly at the age of 56 - 65 years. The results of the study (figure 1.2) show that there is no relationship between age and psychosocial. According to Tjokroprawiro, 2018, the age of 40 years and over must be aware of diabetes since at the age of 35 and over, diabetes often occurs without the patient knowing. The older the person is, the more prone to diabetes they will be if they do not manage a good lifestyle. According to respondents, although most of them are late in age, the stress experienced by the patient can be well anticipated. Patients can deal with stress with the knowledge they already have about preventing diabetic foot ulcer. According to Abbasi Y.F et al. (2018) patients who experience type 2 diabetes in the middle and late ages tend to be bored in taking precautions due to hectic activities. Considering what needs to be done in the prevention efforts is very complex. Changing lifestyle and treatment for a long time is a constraint that is quite significantly felt by patients.

At the time of the implementation of prolans in Gorontalo City, most of the patients who visited were the elderly. Patients under 50 years of age rarely visit the health center because the visits are made by patients when they already suffer other health problems. Patients who came to visit Prolans received oral medication for a full month, which caused the patient not to be strict on a diet. Patients think that they can lower blood sugar naturally because they have taken the drug. The diet will be stricter if the patients run out of drugs to consume. This kind of behavior is reasonable because the fasting blood sugar checks are carried out in conjunction with prolans activities. Patients prepare themselves for the diet a few days before the check since they are required to fast. This situation is evidenced by the fairly high HbA1c value in each patient. According to Tjokroprawiro A. (2018), HbA1c will show a significant increase in the last 3 months if the blood sugar level is high each month. If the HbA1c increases, it indicates the patient's irregularity in dieting.

Another study conducted by Maskari Af et.al., (2013) shows that there is a significant relationship of characteristics (age, education, gender, family history of

diabetes) with psychosocial, especially knowledge. According to the researcher, it is due to the most patients that are late in age so that they are more focused on self-care and health because the level of individual's maturity increases with age.

#### The relationship between characteristics with the Personal Agency for the prevention of diabetic foot ulcer

The results showed that there was no relationship between the characteristics and the patient's personal agency in Gorontalo City. Table 1.1 shows that the characteristics of occupation of most patients are unemployed and retired. According to Riskesdas (2013), the highest number of diabetes patients is in patients with TGT (impaired blood sugar tolerance) in unemployed patients (Ministry of Health 2013). The results showed that physical activity was mostly spent at home. More activities at home cause patients to interact less with the surrounding environment. This condition, when it occurs for a long time, can cause the individual not to interact with the surrounding environment so that the patient is easily senile or forgetful and less passionate about various social life. It was revealed from the results of interviews with patients, which found that the physical activities carried out were not in accordance with what health workers recommended. According to respondents, patients are still confident that they will be able to prevent diabetic foot ulcer even though they only work at home,

Taking drugs for a long time will cause forgetfulness, especially when taking insulin with an incorrect dose (Susanti EY (2017). High blood sugar in diabetes and excessive insulin in the blood will have a bad effect on the brain. It will cause damage to brain cells resulting in Alzheimer if it happens over a long period of time. It is strengthened by the research conducted by Puji A. (2019), which stated that one thing that can cause diabetes patients to experience the risk of senility or forgetfulness is taking diabetes drugs. A study conducted by Leung Y.M.A et al., (2019) shows that there is no relationship between characteristics and personal agencies, especially self-efficacy in carrying out physical activities. Patients that rarely exert physical activity will gain a significant increase in body weight. According to Perkeni (2015), the calorie requirement for obese people with diabetes can be reduced by 20-30% since it can aggravate diabetes. Therefore, diabetes patients should be able to organize both indoor and outdoor activities.

Another study conducted by Wichita N., et al., (2017) shows that there is a significant effect of self-efficacy in

increasing confidence in individuals to improve their quality of life. Perceived control and self-efficacy are variables that play a role in shaping confidence resulting in the intention to behave.

### **The relationship between psychosocial with the personal agency of diabetic patients for the prevention of diabetic foot ulcer**

The study shows that there is a relationship between psychosocial with personal agency. The results of interviews with patients revealed that the patients find difficulty in implementing the diet, especially on a carbohydrate diet. It is because patients are unable to regulate the amount of daily food consumption due to the feeling of emptiness in the stomach when the patients do not consume a large amount of rice. It is committed daily so that it is difficult for the patients to control their carbohydrate consumption. In theory, if the patients can reduce carbohydrates, they will be able to control the increase in blood sugar. Controlling the consumption of carbohydrates will be more difficult in areas that have a habit of consuming sweet foods. Gorontalo is one of the regions that have this habit compared to other regions where sugar consumption is quite low. According to Ramdhani N. (2011), patients' behavior can always change depending on the situation around them and the knowledge they have since individuals who have good knowledge will be able to control their diet.

Knowledge and stress are factors that can increase personal agency. Better knowledge and reduced stress will increase personal agency. According to Ajzen (2005), individuals who are unable to control their thoughts as a result of stress will find it difficult to increase confidence in taking preventive actions. It shows that better knowledge and reduced stress will increase personal agency. The study is strengthened by Chamroonsawasdi K., et al., (2017) where there is a relationship between knowledge and increased self-efficacy in diabetes mellitus patients.

The study shows that the knowledge on the proper diabetic foot care is gained by the patients who know how to conduct the foot care properly through the health center staff that often provides counseling about foot care and complications prevention. Thus, the patient is very confident and capable of preventing wounds and other complications. It shows an increase in patients' good self-efficacy along with increasing knowledge of how to conduct wound prevention. According to Wagner K.A. et al., (2017), After 6 months of providing information about the prevention of diabetes complications, self-efficacy and personal agency for diabetes patients, including routine checks at the health service unit, will increase. This study is strengthened by Fan L. et al., (2014), who conducted counseling on diabetes patients to increase personal agency and self-efficacy in terms of preventing diabetic foot ulcer. The results show that good knowledge about foot care will be able to increase self-efficacy and can be optimized to prevent complications in diabetes patients.

### **Research Limitation**

The research sampling was not conducted on patients who have/or temporarily suffered from diabetic wounds so that psychologically the patient's knowledge and stress level are not known.

## **CONCLUSIONS AND RECOMMENDATIONS**

There is no relationship between the characteristics of the respondent and the personal agency. There is no relationship between psychosocial with the personal agency. There is a relationship between psychosocial with the personal agency for preventing diabetes foot ulcer. The variables of knowledge and stress directly contributed to the improvement of the personal agency for diabetes foot ulcer prevention.

### **Recommendation**

Further research is needed regarding the stress of patients who suffer from diabetic foot ulcer and provide counseling about the knowledge of preventing diabetic foot ulcer to increase perceived control and self-efficacy in preventing diabetic foot ulcer.

### **Conflict of Interest**

The researcher does not have a relationship or conflict of interest with other parties either organizationally or financially in the publication of this study.

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