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# Intention of Diabetic Foot Ulcer Prevention Model Based on Social Support and Personal Agency Perspectives

Nasrun Pakaya<sup>1,2</sup>, Kusnanto<sup>2</sup>, Hari Basuki Notobroto<sup>4</sup>, Rika Subarnasti Triyoga<sup>3</sup>

<sup>1</sup>Student of Doctoral Program of Public Health, Faculty of Public Health, Universitas Airlangga, Mulyorejo Street, Surabaya, Indonesia, <sup>2</sup>Lecturer of Faculty Of Sport and Health, State University of Gorontalo, Indonesia, <sup>3</sup>Lecturer of Faculty of Nursing Universitas Airlangga, Mulyorejo Street, Surabaya, Indonesia, <sup>4</sup>Lecturer of Faculty of Public Health, Universitas Airlangga, Mulyorejo Street, Surabaya, Indonesia, <sup>5</sup>Lecturer of Faculty of Public Health, Universitas Airlangga, Mulyorejo Street, Surabaya, Indonesia

## Abstract

**Context:** A diabetic foot ulcer is one of the complications occurred on diabetes mellitus patients. The incident rate of diabetic foot ulcer improves each year significantly. The research was to arrange the intention of diabetic foot ulcer prevention modal based on social support and personal agency perspectives. This study was included in a cross-sectional study using a questionnaire and a simple random sampling technique on 10 health centers (puskesmas). The research instrument for social support consisted of family's support and friend's support, personal agency consisted of perceived control and self-efficacy, and intention consisted of diet intention, consuming medicine intention, physical activity intention, and foot/blood sugar controlling intention. The data analysis applied SEM-PLS software. The diabetes mellitus patients who did not have ulcer were 329. There was correlation between social support and personal agency of diabetic foot ulcer prevention by having Coefficient value for 0,68, and T value for 16,27, there was correlation between personal agency and intention to prevent the diabetic foot ulcer by having coefficient value for 0,57 and T value for 2,96, and there was correlation between social support and intention to prevent the diabetic foot ulcer by having coefficient value for -0,27 and T value for 2,08. The social support contributed highly to the intention through a personal agency, and the social support contributed directly to intention in preventing the diabetic foot ulcer. It is suggested that diabetes patients should get supports from family and friends to improve the perceived control and self-efficacy hence the intention of diabetic foot ulcer prevention can be improved.

**Keywords:** Social Support, Personal Agency, Intention, Diabetes

## Introduction

A diabetic foot ulcer is one of the dead causes in the world, and it can attack whoever the individual is. Diabetes triggers morbidity such as blindness, kidney failure, and non-traumatic amputations<sup>(1)</sup>WHO predicts that the increase of Diabetes Mellitus sufferers in Indonesia reached 8,4 million in 2000 and will be about 21,3 million in 2030<sup>(2)</sup>. In 1990, Indonesia was in the 16<sup>th</sup> place for diabetes, while it was ranked 6<sup>th</sup> in 2010 and changed to the 5<sup>th</sup> place in 2015.

Amputation is done every day for diabetes mellitus patients in the world <sup>(3)</sup>Data from <sup>(4)</sup>. Riskesdas revealed that Indonesia was ranked 10<sup>th</sup> for the world's highest

foot amputation number. Besides treatment and healthy lifestyle, the patients' behavior is one of the determining factors of the success in preventing the diabetic foot ulcer so that it can decrease the amputation incident rate. The effect of amputation that is occurred in patients with diabetic foot ulcer can cause longer treatment periods, the higher treatment costs, and the more decrease the patients' life qualities. The effect of a diabetic foot ulcer is strongly perceived by the patients, thus, the roles and supports of family are really helpful. The support can be instrumental such as the provision of facilities that can support the patients' activities and the companion during treatment periods in health center, and also material and transportation to the treatment place. Good support from

the family improves the intention of diabetic foot ulcer prevention. This study aims at arranging the intention model of the diabetic foot ulcer prevention behavior based on the perspective of social support and personal agency in city of Gorontalo.

**Material and Method**

This was a cross-sectional study that had been conducted from December 1<sup>st</sup>, 2018 to May 31<sup>st</sup>, 2019 on respondents suffering from the diabetes mellitus. The samples were 329 respondents out of 1516 population. They were diabetes mellitus sufferers who did not have foot ulcer aged 18 years and over, and had been selected by simple random sampling technique. The variables consisted of social support (X1) which was everything around the individuals that influenced the behaviors of them in preventing the diabetic foot ulcer. The social support (X1) itself comprised of family's support (X1.1), and friend's support (X1.2). The question items included assessment support, instrumental support, informational support, and emotional support.

Other than social support (X1), the personal agency was another independent variable (X2). It was the individual's self-ability to prevent diabetic foot ulcer consisting of a perceived variable (X2.1) and self-efficacy (X2.2). The last was the dependent variable namely intention (Y), the strong desire of the individuals themselves to prevent the diabetic foot ulcer involving the dieting intention (Y.1), physical activities intention (Y.2), consuming medicines intention (Y.3), and foot and blood sugar controlling intention (Y.4). The questionnaire had been ethically tested at Airlangga University of Surabaya, and it had owned its validity and reliability tests. Data analysis was completed by SEM PLS (Partial Keast Square) software.

**Findings:** The research result at Table 1 shows that the diabetes patients for elderly category aged 52 - 65 years are 214 (64,3%), female category consisted of 240 respondents (72,9%), respondents who are Senior High School graduates achieve 223 (67,8%), and those who do not have job (housewives and retired employees) are 215 (65,3%).

**Table 1: Respondents' Characteristics, 2019**

Characteristics	Classification	Frequency	Percentage	Mean ± SD Min - Max
Age	Late Adult (35- 45 years)	30	9,0	Mean: 57,29 SD : 8,88 Min : 35 Max : 84
	Early Elderly (46 - 55 years)	42	13,6	
	Late Elderly (56 - 65 years)	214	64,3	
	Elderly > 65 years	23	6,9	
Sex	Male	89	27,1	
	Female	240	72,9	
Job	Unemployment	215	65,3	
	Farmer	61	18,6	
	Private Employee	30	9,1	
	Civil Servant	23	7,0	

Table 2 reveals that respondents who have family's support in less category are 71 respondents (21,3%) and those who receive support from friends in less category are 95 (28,4%), and there are 174 respondents (52,9%) who receive social support in a sufficient category.

**Table 2: Social Support, Personal Agency and Intention to Prevent Diabetic Foot Ulcer Variable**

Variable	Indicator	Category	Total	Percentage	Mean ± SD Min - Max
Social support	Family's Support	Less	71	21,3	44,65 ± 13,32 10 - 60
		Sufficient	116	34,7	
		Good	141	42,2	
	Friend's Support	Less	95	28,4	44,61 ± 14,06 15 - 64
		Sufficient	107	32	
		Good	127	38	

Variable	Indicator	Category	Total	Percentage	Mean $\pm$ SD Min - Max
Overall Social Support Score		Less	43	14,6	89,93 $\pm$ 17,68 37 - 128
		Sufficient	174	52,9	
		Good	107	32,5	
Personal agency	Perceived control	Less	157	47,7	18,89 $\pm$ 6,04 7 - 34
		Good	172	52,3	
	Self efficacy	Less	175	53,2	13,44 $\pm$ 1,80 8 - 16
		Good	154	46,8	
Overall Personal Agency score		Less	168	51,3	32,38 $\pm$ 6,08 19 - 46
		Good	161	48,9	
Intention	Dieting	Less	119	36,2	10,04 $\pm$ 1,33 6 - 12
		Good	210	63,8	
	Physical activities	Less	121	36,8	6,73 $\pm$ 0,92 4 - 8
		Good	208	63,2	
	Consuming medicines	Less	119	36,2	6,72 $\pm$ 0,87 4 - 8
		Good	210	63,8	
	Foot and blood sugar controlling	Less	119	36,2	6,76 $\pm$ 0,90 3 - 8
		Good	210	63,8	
Overall Intention Score		Less	160	48,6	30,27 $\pm$ 2,34 21 - 36
		Good	169	51,4	

Table 2 shows that almost all perceived control in a high category are 172 respondents (52,3%), respondents who have a low category of self-efficacy are 175 (53,2%), and the total of personal agency is in less category for 168 respondents (51,1%). Then, 210 respondents (63,8%) are in high category of dieting

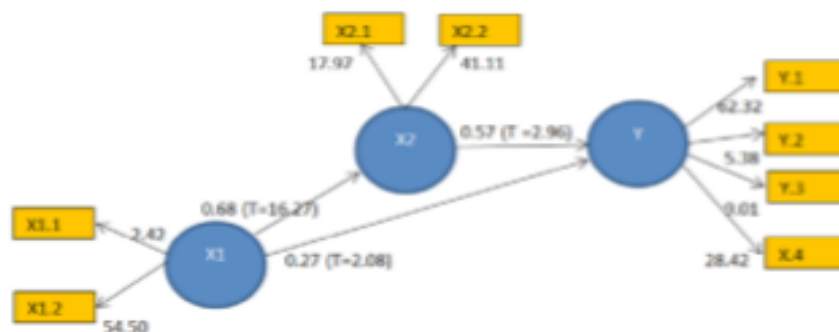
intention, 208 respondents (63,2%) are in high category of physical activities intention, 210 respondents (63,8%) are in high category of consuming medicine intention, and 210 respondents (63,8%) are in high category of foot/blood sugar controlling intention.

**Table 3: Cross Loadings with Convergent Validity and Reliability Result**

Construct and Indicator	Loading (λ)	T-statistics	Chronbach's Alpha	Information
Social support	X1.1	0.968	0.96	Valid & Reliable
	X1.2	0.971		
Personal agency	X2.1	0.954	0.85	Valid & Reliable
	X2.2	0.762		
Intention	Y.1	0.989	0.97	Valid & Reliable
	Y.2	0.987		
	Y.3	0.989		
	Y.4	0.83		

Table 3 reveals that there is no loading factor for less than 0,5 and T-statistical value is less than 1,96, hence all variables are considered significant and all latent

constructs are reliable and marked with the Chronbach's Alpha score which is higher than 0,6.



X1 = Social Support, X2 = Personal Agency, Y = Intention  
 Picture 1; Statistical T Value of Structural Model

**Discussion**

Picture 1 reveals that there is direct correlation between social support with personal agency of diabetic foot ulcer prevention for 0,68 unit with T-statistical value for 16,27 ( $T_{count}$  is higher than  $T_{table}(1,96)$ , there was a direct correlation between personal agency and intention of diabetic foot ulcer prevention for 0,57 unit with T-statistical value for 2,96, and there was direct correlation between social support and intention of diabetic foot ulcer for -0,27 unit with T-statistical value for 2,08.

The social support comprises assessment support, instrumental support, informational support, and emotional support. The research result at picture 1 reveals that there is correlation between social support with the personal agency of diabetic foot ulcer prevention. It is found out that the informational and instrumental supports are required by the patients. The supports can be in the form of discussion among the family members about diabetic foot ulcer prevention and treatment to give when there is an indication of wound to occur and preparing appropriate meals for the diabetes patients. The positive impact felt by the respondents is the improvement of personal agency or individual ability to observe the symptoms of diabetic foot ulcer, and the patients become more confident to do the diabetic foot ulcer prevention.

Family support is required in this phase to assist the patient in preventing potential injury. Diabetic foot ulcer symptoms consisting of less to nothing sensation, dry skin, paralysis in foot area, and callus can be found<sup>(5)</sup>.

Diabetic foot ulcer is one of the sensory nerve defects which can cause the decrease of pain sensation at half to all part of foot area<sup>(6)</sup>. Normally, people who get injured require 2 to 5 days for the inflammation phase till the wound healing process<sup>(7)</sup>.

One of the family support categories experienced less by the respondents is assessment. The support is in the form of dieting support. The family, basically, suggests the patient do a diet, yet there is not any limitation for foods supply, for example, the food containing many calories. Therefore, the respondents are not maximal in running their diet. The research conducted by May beery S.L and Lindsay S., exposes that the behavior of the people around the patients who support the diabetes patient treatment program will increase the obedience of the patients in taking treatment<sup>(8)</sup>.

The research result at picture 1 shows that there is a correlation between personal agency and intention of diabetic foot ulcer prevention. The questionnaire result shows that the respondents are difficult to do physical activities 3 times a week based on the programs of the health center. It is because the respondents are not capable of doing that especially for those who have activities as the housewives. Respondents think that their tasks as housewives are more important than doing exercise. Respondents believe that doing activities as housewives can fulfill the need for physical activities for diabetes sufferers.

The lack of personal Agency, according to the health workers, is initiate by patients having many activities at home. The respondents' ages are in late elderly category





for 56 - 65 years. Their household activities should be adjusted with their ability, hence, the patients should focus only on diabetic foot ulcer prevention and other complications. The nurses, in this case, are having crucial roles in improving the personal agency. According to Hsieh Y. L., et al. the health officers are responsible in improving the patients' intention to follow the diabetes complication treatment because a high personal agency will improve the intention of diabetic foot ulcer prevention<sup>(9)</sup>.

Hence, the health officers and the family can do an orientation to patients about how to prevent any injury when doing activities and how to do foot treatment. If it is well-oriented, it will improve the diabetes patients' intention, hence they will obediently conduct the treatment program. It is strengthened by Pakaya which states that orienting the patients to rules and treatments will improve the intention and obedience of patients in following the treatment<sup>(10)</sup>. It is also supported by Pinidiyapathirage J., et al., that personal agency in self-efficacy is one of the important predictors to improve diabetes patients' intention in doing physical activities<sup>(11)</sup>.

Table 2 shows that the family's support which is in a low category is 21,3%. The lack of family's support, in terms of instrumental support, strongly influences the behavior of diabetic foot ulcer prevention. The instrumental support is performed by helping the patient to do physical activities; the family can accompany the patient to visit the health center. By doing that, the patient will be more enthusiastic to follow the treatment. The study conducted by Lengerke V., K. en L., states that supports from all parties, including family, will improve the intention of patients to prevent the diabetic foot ulcer<sup>(12)</sup>.

The questionnaire result shows that social support from friends strongly helps the individual to visit the health center. The result is supported by Shuhaide N, M, H., et al., that social support has a significant correlation with blood sugar controlling behavior<sup>(13)</sup>. Social support is a heterogenic concept in which it can help o improve the mental health in terms of intention and physical health in preventing he diabetic foot ulcer<sup>(14)</sup>. The intention is also influenced by attitude, perceived norms, and personal agency<sup>(15)</sup>.

According to Ajzen and Fishbein, to do an intention, there should be mutual cooperation with ones who support the intention itself, because intention is

determined by the environment or situational<sup>(16)</sup>. Faries D. M., has stated that there is often a gap between intention of an individual with the expected result in which the respondents who have intention are difficult to realize it in behavior<sup>(17)</sup>.

## Conclusion

The developing model of intention to prevent the diabetic foot ulcer is influenced by supports from family and friends in order to improve the intention through personal agency variable. It is suggested that there should be further research related to knowledge and motivation in improving the intention to prevent diabetic foot ulcer.

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