



## Motivation Study with Prevention of Diabetic Foot Injuries in Gorontalo Province

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### Abstract

**Background:** The World Health Organization (WHO) survey results show that the number of people with diabetes mellitus in Indonesia is ranked the 4th largest globally. Diabetic ulcers are one of the complications that are often found in people with diabetes. Patients with Type II DM need high motivation in carrying out their therapy because the therapy undergone causes boredom, especially when there has been a complication in the form of diabetic ulcers. The purpose of this study is to determine the relationship between intrinsic and extrinsic motivation and actions to prevent diabetic foot injuries, which includes the use of drugs, diet, physical activity, and monitoring of diabetic patients in Gorontalo Province.

**Methods:** This study used a cross-sectional design with a sample of 287 respondents. Data collection instrument in the form of a questionnaire with bivariate analysis using the Chi-Square statistical test

**Results:** The Chi-Square statistical test showed a relationship between motivation and diabetic foot injury prevention measures, both intrinsic motivation and extrinsic motivation, with p-value = 0.000 ( $\alpha = 0.05$ ).

**Conclusion:** There was a relationship between intrinsic and extrinsic motivation and the prevention of foot wounds in people with diabetes in Gorontalo Province. This research is expected to increase motivation so that diabetic foot injuries can be prevented optimally.

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## INTRODUCTION

Diabetes is the cause of many diseases that can spread to any organ (Mamesah et al., 2019). Diabetes mellitus (DM) is a global health problem whose prevalence is constantly increasing, requiring prevention efforts (Puspitasari & Damayanti, 2023). According to Asiri, in Andilala, (2023) Diabetes mellitus is a non-communicable disease and is a state of chronic hyperglycemia accompanied by various metabolic disorders due to hormonal disorders caused by the failure of pancreatic beta cells to produce the hormone insulin. It causes chronic complications in the eyes, kidneys, and blood vessels.

Data from International Diabetes Federation, (2021) said that there are 463 million people in the world who suffer from diabetes mellitus, and it is expected to increase to 578.4 million people in 2030 and 700.2 million in 2045. Data in Indonesia there are 1.017.290 people with diabetes mellitus (Nisak, 2021). According to the results of a survey by the World Health Organization (WHO), the number of people with diabetes mellitus (DM) in Indonesia ranks fourth largest in the world. Considering that diabetes mellitus will have an impact on the quality of human resources and a considerable increase in health costs, all parties, both the community and the government, should participate in efforts to control diabetes mellitus (Nadia, 2018).

Diabetes mellitus is known to cause problems in almost all organs, both because of the metabolic and vascular disorders it causes (Li et al., 2024). The increasing number of people with diabetes mellitus shows that the risk of complications that will occur is also increasing. Complications of diabetes can occur from head to toe, from heart disease and stroke to kidney failure and painful infections, especially foot infections that can lead to amputation. All of this can ultimately cost lives (Liu et al., 2024). Diabetic wounds or ulcers can occur due to preneural abnormalities, vascular abnormalities, and then infection. If the infection is not treated correctly, it will continue to decay and can even be amputated (Januarista & Suriawanto, 2019) (Andilala, 2023).

The risk of diabetic feet can be prevented by doing foot care in DM patients (Bayu et

al., 2019). Foot care is one of the components to prevent diabetic feet; if done regularly, it can reduce the number of amputations by around 50%. People with DM who do not have diabetic ulcers should do foot care as the best effort besides being relatively cheap and more accessible to do than diabetic ulcer treatment (Puspitasari & Damayanti, 2023).

Diabetic foot care is one of the measures to prevent injuries to the feet of people with diabetes mellitus (Asnaniyar, 2025). The World Diabetes Foundation (WDF) has established several measures in carrying out foot care for people with diabetes mellitus, which include foot checkups, washing feet properly, drying feet, using moisturizers, wearing footwear, and doing first aid in case of injury and diabetic foot exercises. Some of the actions have advantages, such as doing diabetic foot exercises can facilitate blood flow to the feet, and the use of blisters and footwear has benefits to prevent the feet from getting injured (Syairozi, 2024).

Health worker support can influence wound-prevention behavior in people with DM (Katuuk & Kallo, 2019). Health workers such as nurses act as educators by providing appropriate information about the disease, providing health education related to prevention so that complications do not continue, providing treatment to people with diabetes mellitus, and providing health education on how to properly manage diabetes mellitus so that it can motivate people with diabetes mellitus (Puspitasari & Damayanti, 2023).

Patients with Type II DM need high motivation in carrying out therapy because the therapy undergone causes boredom, especially when there has been a complication in the form of diabetic ulcers (Rahmiyanti et al., 2019). Efforts to keep sugar levels stable and complications do not occur depending on the motivation and knowledge of the person with the disease (Andoko et al., 2020).

Based on the description, the study aims to examine the relationship between intrinsic and extrinsic motivation in preventing diabetic foot wounds in Diabetes Mellitus patients in Gorontalo Province.

## METHOD

This quantitative study analyzes

the relationship between motivation as an independent variable and diabetic foot injury prevention as a dependent variable in Gorontalo Province. The research was conducted from February - May 2024. The design of this study uses a cross-sectional type. The population in this study was type 2 diabetes mellitus patients spread across several hospitals in Gorontalo Province. Sampling was done using the purposive sampling technique with the Slovin formula, so a sample of 287 respondents was obtained. The data collection instrument used in this study is a questionnaire sheet for both variables.

The data from this research was processed manually by grouping the interviews, observations, and questionnaire results. Scores were calculated and analyzed using statistical tests through the computerized system of the SPSS application, which had several stages, namely editing, coding, entering, and cleaning (Notoatmodjo, 2018). Bivariate analysis in this study used statistical tests Chi-Square with a significance level of 95% ( $\alpha = 0.05$ ). The research

was conducted after obtaining ethical clearance documents from the Health Research Ethics Commission of Universitas Negeri Gorontalo, with registration number 076A/UN47.B7/KE/2023. All subjects participating in the study provided informed consent before the research was carried out.

**RESULTS AND DISCUSSION**

The management of diabetes consists of education, physical exercise, pharmacological therapy, and medical nutrition therapy (diet) (Nurhayati et al., 2020). Medical nutrition therapy (Diet) is a method used to regulate the patient's nutritional intake so that it remains fulfilled and does not cause blood sugar to increase, so it is necessary to regulate the schedule, type, and amount of food as a reference for the diabetic diet. Dietary adherence aims to control sugar levels in the blood to realize a better quality of life for people with diabetes. Diabetic diet adherence needs to be considered because if not paid attention, it will lead to complications. (Mamesah et al., 2019).

Table 1. Distribution of research respondent frequency based on demographic data

Category	Number (n)	Presentation (%)
<b>Gender</b>		
Man	72	25.1
Woman	215	74.9
<b>Sum</b>	<b>287</b>	<b>100</b>
<b>Age</b>		
35-45 Years	31	10.8
46-55 Years	128	44.6
56-65 Years	105	36.6
>65 years	23	8
<b>Sum</b>	<b>287</b>	<b>100</b>
<b>Period Suffering from Diabetes Mellitus</b>		
± 5 Years	179	62.4
>5 Years	108	37.6
<b>Sum</b>	<b>287</b>	<b>100</b>

The results of the study showed that based on the gender of the total 287 respondents, most of them are female, amounting to 215 people (74.9%); in terms of age, the results were obtained that the average respondent is in the early elderly age category of 46-55 years with a

total of 128 people (44.6%) and after the middle elderly 56-65 years old totaling 105 people (36.6%), while based on the old category of suffering from DM, most of the respondents, namely 179 people (62.4%) suffered from DM less than five years.

Table 2. Frequency distribution of research respondents based on variables Motivation and Wound Prevention Measures

Category	Number (n)	Presentation (%)
<b>Intrinsic Motivation</b>		
Low	8	2.8
Keep	188	65.5
Tall	91	31.7
<b>Sum</b>	<b>287</b>	<b>100</b>
<b>Extrinsic Motivation</b>		
Low	3	1
Keep	141	49.1
Tall	143	49.8
<b>Sum</b>	<b>287</b>	<b>100</b>
<b>Motivation</b>		
Low	4	1.4
Keep	166	57.8
Tall	117	40.8
<b>Sum</b>	<b>287</b>	<b>100</b>
<b>Wound Prevention</b>		
Less	7	2.4
Enough	212	73.9
Good	68	23.7
<b>Sum</b>	<b>287</b>	<b>100</b>

The data showed that based on the Intrinsic Motivation category, it can be seen that some respondents had a moderate level of intrinsic motivation, as many as 188 people (65.5%), and respondents with a high level of intrinsic motivation, as many as 91 people (31.7%). These results are supported by Mamesah et al. (2019), who stated that most of them (83 respondents) had good intrinsic motivation, namely 59 people, with a percentage of 71%. One factor affecting compliance in preventing DM complications is intrinsic motivation. Intrinsic motivation is the belief from within a person that he can perform specific tasks or responsibilities that he must do or the belief that comes from within himself because of the environment's encouragement (Mamesah et al., 2019).

Based on the study's results, most of the 287 respondents had high extrinsic motivation, at about 143 people (49.8%). These results are in line with the research conducted by Nadia, (2018) with indicative results, most respondents had high motivation at 43 people (59.7%). If a person starts to be motivated,

then there will be an urge to do something; here, the patient will believe in preventing DM complications. External motivation comes from outside the individual, namely from the environment. One environment that influences the prevention of DM complications is the family environment. The role of the family in supporting the patient in recovering can support recovery and prevent complications of DM.

The results show that most respondents had moderate motivation, namely 166 people (57.8%), and those with high motivation, as many as 117 people (40.8%). These results are in line with the research conducted by Andoko et al., (2020), which resulted in most of the respondents having a high level of motivation, with a total of 27 people (56.2%). High motivation can influence the self-efficacy of type 2 DM patients in self-care.

Based on the research results, it can be seen that most respondents have sufficient foot injury prevention measures, namely 212 people (73.9%). This result is in line with research conducted by Puspitasari & Damayanti (2023) which

stated that respondents with a moderate level of gangrene injury prevention behavior were 31 people (83.7%). Prevention of foot injuries in people with DM needs to be considered to prevent ongoing complications. The research supported by Arifin & Wulandari (2021) Diabetic foot wounds are one of the worst chronic complications of DM as a result of its management. Diabetic feet not correctly cared for will easily get hurt and quickly develop into

ulcers if not treated properly.

Diabetic Foot Infection can be prevented from turning into gangrene. Diabetic foot wounds are one of the worst chronic complications of DM as a result of its management. The feet of diabetics that are not properly cared for will easily become injured and quickly develop into gangrenous ulcers if not properly cared for (Rohmah, 2019).

Table 3. Relationship between motivation and wound prevention

Category	Wound Prevention						Total		p-value
	Less		Enough		Good		n	%	
	n	%	n	%	n	%			
<b>Intrinsic Motivation</b>									
Low	0	0	7	2.4	1	0.3	8	2.8	0.000 ( $<\alpha$ 0.05)
Keep	7	2.4	165	57.5	16	5.6	188	65.5	
Tall	0	0	40	13.9	51	17.8	91	31.7	
<b>Sum</b>	<b>7</b>	<b>2.4</b>	<b>212</b>	<b>73.9</b>	<b>68</b>	<b>23.7</b>	<b>287</b>	<b>100</b>	
<b>Extrinsic Motivation</b>									
Low	0	0	3	1	0	0	3	1	0.000 ( $<\alpha$ 0.05)
Keep	6		125	43.6	10	3.5	141	49.1	
Tall	1	0.3	84	29.3	58	20.2	143	49.8	
<b>Sum</b>	<b>7</b>	<b>2.4</b>	<b>212</b>	<b>73.9</b>	<b>68</b>	<b>23.7</b>	<b>287</b>	<b>100</b>	
<b>Motivation</b>									
Low	0	0	4	1.4	0	0	4	1.4	0.000 ( $<\alpha$ 0.05)
Keep	7	2.4	150	52.3	9	3.1	166	57.8	
Tall	0	0	58	20.2	59	20.6	117	40.8	
<b>Sum</b>	<b>7</b>	<b>2.4</b>	<b>212</b>	<b>73.9</b>	<b>68</b>	<b>23.7</b>	<b>287</b>	<b>100</b>	

Based on the research results, it can be seen that from a total of 287 respondents, most of them had a moderate level of intrinsic motivation with adequate prevention of foot injuries, namely 165 people(57.5%), and with this result, a score of p-value = 0.000 ( $\alpha=0.05$ ) which means that there was a relationship between Intrinsic Motivation and Prevention of Diabetic Foot Injuries. These results are supported by Mamesah et al. (2019)stated that the relationship between intrinsic motivation and DM diet adherence with the results that 53 respondents (63.9%) had good intrinsic motivation and diet adherence for DM prevention with a value of p-value = 0.000 ( $\alpha=0.05$ ), which means that there was a relationship between intrinsic motivation and DM diet adherence.

Intrinsic motivation is the motivation that arises from within the individual to achieve

something in order to satisfy himself and without being influenced by external rewards (Andilala, 2023). The results of this study support the theory that intrinsic motivation is one factor that affects the DM diet (Amin & Haryanti, 2018). The theory put forward by Notoatmodjo, (2010) said that the factors that can affect compliance include intrinsic motivation because intrinsic motivation is one of the factors that influence patient compliance; the higher the patient's motivation, the greater the chance to comply with the recommended diet; intrinsic motivation is the state in the person who encourages to do certain activities to achieve the desired goal (controlling blood sugar) (Mcglain et al., 2021).

The results also show that out of a total of 287 respondents, most of them had a moderate level of extrinsic motivation with adequate prevention of foot injuries, namely 125 people

(43.6%), and with this result, a score of p-value = 0.000 ( $\alpha=0.05$ ) which means that there was a relationship between extrinsic motivation and prevention of diabetic foot injuries. These results are supported by research conducted by (2024). In his study, it was stated that there was a positive relationship between motivation from family support and healing of DM wounds, and the value of p-value = 0.377. This study's findings also align with several other studies, such as Chalekah (2020). It also found a relationship between family motivation and adherence to the type 2 diabetes diet ( $p=0.001$ ).

Extrinsic motivation arises from the desire to get something from other people or outsiders, such as other people's recognition, awards, specific goods, and compliments. (Zuiatna, 2020). For people with DM, extrinsic motivation can be in the form of recognition from others that they have successfully taken care of themselves and prevented complications from the disease they suffer from (Arinimi et al., 2024). Based on the results of interviews with several respondents, they said they felt happy when they were praised for being able to control blood sugar levels and take care of their legs so there were no injuries.

Based on the results of the study, it can be seen that out of a total of 287 respondents, most of them had a moderate level of motivation with sufficient prevention of foot injuries, namely 150 people (52.3%), and with this result, a score of p-value = 0.000 ( $<\alpha = 0.05$ ) which means that there is a relationship between motivation and prevention of diabetic foot injuries. These results are in line with the research by Andilala (2023) His research on 53 respondents showed that they mainly had enough motivation to do foot care, as many as 28 respondents (52.8%). This is supported by Andoko et al., (2020) The study results showed that most of the respondents with high motivation in preventing complications of DM disease were as many as 27 respondents (56.3%). With a moderate and high level of motivation, people with DM can be encouraged to take care of themselves and prevent complications of DM disease.

The results of this study are also by previous research conducted by Rohmah (2019) There was a positive relationship between the motivation of type 2 diabetes

mellitus patients about the risk of diabetic ulcers and the incidence of diabetic ulcers at Dr. Moewardi Hospital. The role of patient motivation indirectly comes from the support of health workers to play a role in preventing diabetic ulcers. This research is also supported by Puspitasari & Damayanti, (2023) That is, a relationship exists between motivation and behavior to prevent gangrene injuries with a p-value = 0,000 ( $\alpha=0,05$ ).

The motivation for people to prevent complications is a strong belief in the importance of preventing disease complications (Nadia, 2018). In addition to being intrinsic and extrinsic, the motivation provided can also be in the form of support from outside parties such as family and health workers so that it can encourage behavioral change in preventing diabetic foot injuries (Noorratri & Lani, 2019) (Setawan et al., 2020). This is supported by the theory of behavioral and Humanities of Puspitasari & Damayanti (2023), which explains that With the support and motivation of individuals, they will be encouraged to change their behavior for the better. In the humanities, individuals will try to maximize their potential towards the expected direction for people with DM, which is healthy and with no diabetic foot injuries.

This study shows that motivation has a close relationship with the implementation of foot care carried out by diabetic mellitus patients; this is because motivation is the motivation that a person has to take action, and the motivation of diabetic mellitus patients will support the implementation of foot care both obtained from within the patient himself or from others. The motivation obtained by the patient will encourage him to maintain his health by managing diabetes mellitus, including more optimal foot care, compared to diabetic mellitus patients with low motivation.

## CONCLUSION AND ADVICE

The results of the study of 287 respondents showed that there was a close relationship between motivation and the prevention of diabetic foot injuries. Respondents with moderate motivation had a pretty good prevention of diabetic foot

injuries. Just as respondents with moderate intrinsic motivation had adequate prevention of diabetic foot injuries, respondents with moderate extrinsic motivation also had adequate prevention of diabetic foot injuries.

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