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Motivation and compliance to type 2 diabetes mellitus diet in the work area of Puskesmas Padalarang

Deshita Rimadania,[1] Eka Afrima Sari,[2,*] Citra Windani Mambang Sari[3]

[1]*Nursing Department, Faculty of Nursing, Padjadjaran University, Bandung, Indonesia*
[2]*Department of Medical Surgical Nursing, Faculty of Nursing, Padjadjaran University, Bandung, Indonesia*
[3]*Department of Community Nursing, Faculty of Nursing, Padjadjaran University, Bandung, Indonesia*

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ABSTRACT Type 2 Diabetes Mellitus (DM) is one of chronic diseases resulting from decreased insulin production and is characterized by an increase in glucose in the blood. Dietary adherence is one of the effective managements that can control blood sugar levels. This management requires supporting factors and one of them is motivation. This research aimed to describe the motivation and dietary compliance of patients with type 2 DM at the working area of Puskesmas Padalarang. This quantitative descriptive research used a cross-sectional approach. The samples were selected using proportional random sampling techniques. This study used the Treatment Self-Regulation Questionnaire (TSRQ) with the validity score 0.4821 and a diet adherence questionnaire with the validity score 0.4732. The results showed that the internal motivation of respondents was a good internal motivation with 33.3% and 66.7% had low motivation. Only 2.2% had good external motivation and almost all respondents had a low external motivation with 97.8%. Meanwhile, there were only 3.3% with a good level of adherence, 94.4% with a sufficient level of adherence and 2.2% had a poor level of diet adherence. Therefore, it is expected for Puskesmas to implement more motivational interviewing therapy to increase motivation and diet adherence in type 2 DM patients.

1. Introduction

Diabetes mellitus (DM) is a chronic non-communicable disease that has become a serious threat for global health. The prevalence of DM in the world is 8.8%.[1] Indonesia is the fourth largest country with the highest number of diabetics in the world, namely around 8 million people in 2000 and this is expected to rise to 21 million in 2030.[2] Currently, the number of DM sufferers in Indonesia have increased to 8.5% in 2018 from 6.9% in 2013.[2] West Java is in the range of 2.0% or 643,246 of its number of patients with 418,110 (1.3%) sufferers having been diagnosed with DM and the rest have never been diagnosed with DM.[2]

DM is a disorder in the metabolic system characterized by hyperglycemia caused by abnormalities in insulin secretion or insulin function, which results in abnormalities in the metabolism of carbohydrates, fats and proteins.[2] One of the risk factors is an unhealthy lifestyle, which can lead to excess body weight, less physical activity, hypertension, dyslipidemia, and unhealthy diet[3]. An unhealthy lifestyle and inadequate physical activity may lead to obesity which increases the risk for type 2 DM.[2] Lifestyle change is the main intervention because it is able to control blood sugar levels of the body which can reduce the complications and even death rates of sufferers.[4,5,6] Physical complications found in patients with macrovascular diabetes in as many as 66.5% are often macrovascular, which consist of coronary heart disease (33%), cerebral vascular disease (18.8%), and peripheral vascular disease (30%). In addition, microvascular disease occurs in as many as 81.7%, which consists of diabetic retinopathy (37.5%), diabetic nephropathy (42.7%), and diabetic neuropathy (23.4%). The principles of the recommended diet are usually daily regulated, strict, and monotonous.[7] Diet management

*Correspondence: e.afrima@unpad.ac.id
Department of Health Behavior, Environment, and Social Faculty of Nursing, Universitas Padjadjaran, Jl. Raya Bandung Sumedang KM 21, Kab. Sumedang 45363, Indonesia

according to the Indonesian Endocrine Association[8] can be done by adjusting the number, type, and schedule of meals. The application of this diet is a major component in the successful management of DM because it requires compliance and motivation from sufferers.

According to a study conducted by Mona in 2012 at Tugurejo Hospital in Semarang, there is a relationship between dietary compliance and blood sugar levels, which found as many as 73.5% of DM patients were obedient to treatment recommendations.[9] Another study showed that from 74 respondents, as few as 4 adhered to their recommended diet, so that only their blood sugar levels decreased every month.[10] Compliance with this diet needs to be applied in the daily meal menu, thus a good motivation is needed for sufferers in order to control blood sugar levels.[11] According to Maslow's theory as discussed by Andjarwati in 2015, motivation is a form of individual encouragement both internally and externally to do something or to behave in order to meet their needs. A person will be motivated because of unmet needs so that they will be determined to change a behavior in order to achieve their needs.[11] Self-motivation is one of the most influential psychosocial factors in maintaining diet for sufferers of type 2 DM.

Some researchers who conducted research on dietary compliance found that from 30 respondents as many as 60% did not adhere to the implementation of the diet while the remaining 40% were obedient in implementing the diet.[11] For the variable of motivation, as many as 53.3% had poor motivation and 46.7% had good motivation. Another study conducted by Dwi, Darwin, and Rismadefi in 2018 with 40 respondents found that there was a relationship between dietary compliance of DM patients with patient self-motivation.[12] The result were contradictory showing patients with good motivation tended to be able to maintain dietary compliance by 329.667 times more compared to respondents who had high motivation, which were less good.[12] On this basis, researchers are interested in conducting a study on motivation and dietary compliance in sufferers of type 2 DM in the Puskesmas Padalarang's work area. It is known that the West Bandung area contains problems related to motivation and dietary compliance so that it becomes more significant to conduct further research.

2. Method

This quantitative descriptive research used a cross-sectional approach consisting of motivation and dietary compliance variables. The population in this study are sufferers with type 2 DM in the work area of Puskesmas Padalarang with a total of 610 respondents. The sampling in this study used proportional random sampling techniques that amounted to 90 respondents using the Slovin formulation with a percentage of 10%. The inclusion criteria in this study were people with type 2 DM who participated in the PROLANIS program at least once and who had been diagnosed for more than one year. The exclusion criteria in this research were DM sufferers who were pregnant or breastfeeding. This research received approval from the Ethics Committee of Padjadjaran University with letter number 180/UN6.KEP/EC/2020. Data were collected by visiting each prospective respondent's house based on inclusion criteria, accompanied by candidates who became research assistants. The researcher explained the research objectives to prospective respondents. Furthermore, prospective respondents were free to choose to participate as respondents or not by agreeing and signing the informed consent sheet. Respondents themselves filled out the questionnaires that had been given by the researcher. Data were collected between February 24th, 2020 – March 20th, 2020.

This research used the Treatment Self-Regulation Questionnaire (TSRQ) instruments for motivation variables and dietary compliance questionnaire for dietary compliance variables. TSRQ has been translated into Indonesian by Ernawati, Setiawati and Kurniawan in their research titled, "The Effect of Internal and External Motivation on Diabetes Self-Management in Gombong District, Kebumen, Gombong Regency" with validity test value of 0.4821 and reliability test of 0.918.[13]

The dietary compliance questionnaire was previously used in Retno's research titled, "The Relationship between Motivation and Health Locus of Control with Diet Compliance in Diabetes Mellitus

Patients".[16] This questionnaire has been modified and the validity test has been done with a value of 0.4732 and a reliability test value of 0.926.[16]

3. Result

Table 1 describes the demographic characteristics where the majority of the largest age group in this study are the middle age (56-65 years) with as many as 38 respondents (42.2%). Meanwhile, most of the respondents are women, namely 65 respondents (72.2%). Most of the respondents in this study have elementary / equivalent education level with as many as 45 respondents (50%). For profession, most respondents in this research are unemployed, namely as many as 61 respondents (67.8%). The majority of respondents are married, with as many as 73 respondents (81.1%). As many as 79 respondents (87.8%) have health insurance.

Table 2 describes the related health characteristics in which the most common body mass index (BMI) group in this research was the normal BMI group (18.5-22.9) with as many as 35 respondents (38.9%) with a history of type 2 DM <5 years, namely as many as 57 respondents (63.3%). Respondents have a balanced number between those are not having complications and those with complications, namely 45 respondents (50%). The daily activities of the respondents in this study were generally household work, namely 50 respondents (55.6%). By viewing the DM drug therapy, most of the DM patients who became respondents perform DM drug therapy with as many as 75 respondents (83.3%). From the 75 respondents who perform DM drug therapy, about 67 respondents (74.4%) do oral DM drug therapy. About 76 respondents (84.4%) in this study do not smoke. Most respondents in this study carry out routine control more than once per month, namely as many as 68 respondents (75.6%). Meanwhile, it is indicated from routine blood sugar checks that 72 respondents (80%) routinely perform a check of their blood sugar more than once a month.

Table 1. Demographic characteristics of the respondents (n=90)

Demographic characteristic	Frequency (f)	Percentage (%)
Age		
Adult (<45 year)	17	18.9
Middle age (45-59 year)	38	42.2
Elderly (60-74 year)	26	28.9
Old (75-90 year)	9	10
Gender		
Male	25	27.8
Women	65	72.2
Education		
None	3	3.3
Elementary school/ equivalent	45	50
Junior High School/ equivalent	27	30
High School/ equivalent	12	13.3
College	3	3.3
Profession		
Unemployed	61	67.8
Farmers/Traders/Laborers	28	31.1
Etc.	1	1.1
Marital Status		
Married	73	81.1
Widow/Widower	17	18.9
Health Insurance		
Available	79	87.8
Not Available	11	12.2

The description of motivation (Table 3) found that most of the respondents' both internal and external motivations indicate results in the poor category, with 60 respondents (66.7%) for internal motivation and 88 respondents (97.8%) for external motivation. Table 4 illustrates the description of dietary compliance and it was found that almost all respondents had adequate dietary compliance with as many as 85 respondents (94.4%).

4. Discussion

4.1 Internal Motivation

Based on the results of the data analysis in this study in Table 3 related to the description of motivation in patients with type 2 DM in the work area of Puskesmas Padalarang, it was found that most respondents had poor internal motivation (66.7%). In another study conducted by Bertalina in 2014 in the Internal Medicine Department of RSUD (Local Public Hospital) of Dr. H. Abdul Moeloek found that 53.3% of respondents had poor motivation.[11] This is due to a lack of self-confidence and difficulty with the diet recommended by health workers. In addition, respondents believe that consuming drugs provided

Table 2. Health characteristics of the respondents (n=90)

Health characteristic	f	%
BMI (body mass index)		
Underweight (<18.5)	6	6.7
Normal (18.5-22.9)	35	38.9
Overweight (23-24.9)	20	22.2
Obese I (25-29.9)	16	17.8
Obese II (>30)	13	14.4
How long suffering from DM		
<5 years	57	63.3
≥5 years	33	36.7
Complication		
Hypertension	30	33.3
Heart disease	4	4.4
Renal failure	3	3.3
None	45	50
>1 disease	8	8.9
Daily activity		
Working	19	21.1
Household	50	55.6
Unemployment	15	16.7
>1 activity	6	6.7
DM drug therapy		
Yes	75	83.3
Not	15	16.7
Type of DM drug therapy		
Oral	67	74.4
Injection	3	3.3
Oral & Injection	5	5.6
Smoking		
Yes	14	15.6
No	76	84.4
Routine control (times/month)		
Never	22	24.4
≥1	68	75.6
Blood Glucose Level Check (times/ month)		
Never	18	20
≥1	72	80

by health workers can control blood sugar well so that controlling blood sugar by the diet method is believed to be less needed.[11]

The majority of these respondents said that they felt not ashamed if they neglected their diet properly and only a small proportion of them felt unhappy if they had to eat a special diet regularly. In addition, most respondents feel innocent when their diet is irregular and feel there is no challenge in being able to learn how to live with DM so they tend to always eat the food they like repeatedly without feeling guilty. The problem for DM sufferers when their blood sugar levels are within the normal range is that the majority of these respondents ignore their dietary compliance due to feeling healthy and having no other complaints. This makes them go back to consuming food carelessly.

4.2 External Motivation

Based on the results of the data analysis in this study in Table 3 related to the description of motivation in patients with type 2 DM in the work area of Puskesmas Padalarang, it is found that almost all respondents had poor external motivation, with as many as 97.8%. It is due to most respondents having a higher level of confidence to recover from DM themselves more than the influence of the outside environment. They realize the consequences of non-compliance may make their blood sugar unstable and increase the risk of complications that may occur. However, most respondents thought that they felt healthy even though they do not maintain their diet properly. In addition, almost all respondents often feel bored with the food and medicines they consume, so they tend to eat food carelessly. However, in a study conducted by Toruan and Karim[13] in the work area of Puskesmas Harapan Raya Pekanbaru with 40 respondents, it was found that about 52.5% had good motivation.[13] This is because respondents have a high desire and expectation so that blood sugar can be controlled and avoid further complications. They believe that regular control and diet as recommended by health workers can keep blood sugar levels within normal ranges. In addition, they can find out which interventions are best for further treatment.[13]

In addition, it is caused by a lack of appreciation from people around them for DM disease. The majority of respondents thought that they set their diet only for themselves and not because of other people. They say that the people around them do not care about their illnesses, thus sometimes they feel less appreciated, loved and less caring about having a good diet. The majority of respondents have the self-esteem that feels fit in front of others. They do not want other people to see themselves as sick people, especially if they have experienced physical

Table 3. Diet motivation of the respondents

Variable	Sub variable	Category			
		Good		Less good	
		f	%	f	%
Motivation	Internal	30	33.3	60	66.7
	External	2	2.2	88	97.8

Table 4. Diet adherence of the respondents

Variable	Category					
	Good		Sufficient		Poor	
	f	%	f	%	f	%
Diet Adherence	3	3.3	85	94.4	2	2.2

changes.

Most of the respondents in this research, namely 78 respondents, follow their diet because of the recommendations given from health workers regarding meal patterns. In addition, 74 other respondents thought they wanted to be good DM sufferers for health workers who always monitored their health. This issue becomes important and provides opportunities for health workers because there are still many respondents who believe that health workers are an external factor that can help control the respondents' blood sugar.

In the research conducted by Ernawati[14], the longer the patient suffers from DM, the higher the patient's saturation level in controlling blood sugar levels. However, in the research that was conducted, most respondents have a history of less than five years with a tendency for poor motivation levels due to fatigue in adjusting their diet.

4.3 Diet Compliance

Based on the results of the data analysis in this study in Table 4 regarding the description of dietary compliance in patients with type 2 DM in the work area of Puskesmas Padalarang, it is found that most of the respondents had a sufficient level of dietary compliance, namely 94.4%. This is because the types of food consumed by respondents are high fat foods such as fast food or fried foods. But they also often eat healthy foods such as vegetables, fruits and protein. In this study, the majority of respondents rarely ate main meals more than 3 times a day because they ate small meals and snacked more often than they ate main meals. In this study, the majority of respondents do not follow the recommended eating schedule rules. They have difficulty complying with meal schedule rules, especially when they are busy. Not infrequently, the majority of respondents in this study, namely 66 respondents, often eat small meals and snacked outside the predetermined meal schedule and types. This is due to they feel bored with the principles of a predetermined diet so that they often eat foods that are not good for their health.

In a research is conducted by Retno in 2018 in five work areas of Puskesmas in Surabaya, only 29 respondents out of 106 respondents had sufficient dietary compliance.[16] That study showed the highest category was the level of good dietary compliance with as many as 70 people. This is due to the respondents thinking that they still have a chance to improve their health so that most respondents have a good level of dietary compliance. In this study, it is shown that the factors influencing dietary compliance are the lack of DM health services, the respondents' low level of knowledge, working patients, and low economic status that make it difficult for people to comply with dietary recommendations.[17]

5. Conclusion

The results of this research indicate that more than half of the respondents have poor internal motivation, and only a small proportion have good internal motivation. Almost all respondents have poor external motivation, and only a few have good external motivation. The level of dietary compliance of respondents was mostly adequate dietary compliance, with most of the others having good

dietary compliance, and only a small proportion of them had poor diet compliance. Based on the results of this study, most sufferers of type 2 DM have poor internal and external motivation and adequate levels of dietary compliance. This does not rule out the impact on the level of dietary compliance which becomes worse due to decreased motivation or various other influences. *Puskesmas* can develop a more appropriate program or intervention, which immediately provides additional effort to increase motivation and dietary compliance for people with type 2 DM. One of the interventions that can be done is motivational interviewing therapy. This therapy is a cognitive therapy in the form of counselling that focuses on making decisions based on a patient's own desires and beliefs.

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Conflict of interests

There no conflict of interest.

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