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Medication compliance and related factors among readmission people with type 2 diabetes at 108 Military central Hospital

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ABSTRACT

***Objectives**: Survey on medication compliance rate and related factors in people with type 2 diabetes readmitted for inpatient treatment at 108 Central Military Hospital. **Participants and methods:** A cross-sectional descriptive study was conducted on 168 patients with Type 2 diabetes readmission from January 2021 to December 2022. The study assessed medication adherence using the MARS–5 questionnaire (Medication Adherence Report Scale 5). **Results**: The rate of medication compliance in patients was 21.8%, non-compliance accounted for 78.2%. Patients who occasionally forget to take medication account for the highest rate of 51.8%, arbitrarily reducing the dose to less than the prescribed dose accounted for 32.1%, rarely skipping doses, and stopping medicine for a period of time accounted for 35.7% and 50.2%, respectively. There was a relationship between age and current medication and medication compliance. The difference was statistically significant($p < 0.05$). **Conclusion**: The medication compliance rate in diabetic patients readmitted to the hospital in the study was low, only 21.8%, of which patients forgot to take medication and arbitrarily reduced the dose and stopped using medication for a period of time accounting for the highest proportion. high rate. Strengthening health education on medication adherence during follow-up examinations for patients and caregivers is extremely necessary to reduce the risk of hospital readmission, maintain blood sugar at normal levels, and minimize diabetes complications.*

***Keywords**: Medication treatment, Type 2 diabetes, Hospital readmission.*

INTRODUCTION

Diabetes mellitus (DM) is currently a common and rapidly increasing disease worldwide. In 2020, it is estimated that the number of adults with diabetes globally will be 438 million and is expected to increase to 630 million by 2045 [1]. Drug treatment is the recommended strategy to control blood sugar and HbA1C. Despite significant advances in the development and production of potent and effective medications over the past few decades, achieving good blood sugar control remains difficult. The reason is that drug treatment compliance is low, increasing the risk of early complications, loss of treatment costs, increased hospital readmission rate and increased risk of death. Globally, diabetes accounted for 11% of

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total healthcare costs in 2011. In 2017, the total estimated cost of diabetes in the United States was ≥ 327 billion VND [2]. Recently, Egede et al. It emerged, in a 4-year study of more than 700,000 people with diabetes, that patients who are non-adherent to medication can have 41% higher annual inpatient costs [3].

Several factors contribute to medication nonadherence, including economic conditions, education level, lack of awareness, and inadequate family or community support. Along with that, patients have many comorbidities and the use of many medications in the elderly is a big challenge to medication compliance [4]. 108 Military Central Hospital is the last-line specialized hospital of the entire army, a medical examination and treatment facility for the people of the country. The number of people with type 2 diabetes managed at the hospital is very large. Therefore, we conducted a study with the following objectives: Survey the rate of medication compliance and some related factors in patients with type 2 diabetes readmitted to the inpatient hospital at 108 Central Military Hospital.

RESEARCH PARTCIPANTS AND METHODS

Research subjects: Patients with type 2 diabetes were readmitted to the Department of Endocrinology, 108 Military Central Hospital.

Selection criteria: Patients with type 2 diabetes were readmitted to the hospital for inpatient treatment for the second time due to failure to achieve target blood sugar control and agreed to participate in the study. Patients have the ability to read, listen, and understand. Hospital readmission is not due to acute complications of diabetes such as hyperosmolar coma, acute kidney failure, ketoacidosis, or hypoglycemia.

Exclusion criteria: Patients with mental illness, language, or hearing impairment. Readmission to hospital due to acute diseases of diabetes.

Research time and location: From January 2021 to December 2022 at the Department of Endocrinology, 108 Military Central Hospital.

Research design: Cross-sectional study

Sampling method: Select the entire sample, all patients meet the selection criteria. During the research period, the research team selected 168 qualified patients to participate in the study.

Data collection

- *Step 1:* Collect information about the participants' anthropometrics and pathological characteristics.

- *Step 2:* Conduct interviews with participants using the medication adherence assessment tool MARS - 5 (Medication Adherence Report Scale) developed by Horne R (1999) with Cronbach's alpha coefficient of 0.8; The questionnaire includes 5 items based on the frequency of each behavior and is scored as follows: 1 - Always; 2 - Regularly; 3 – Occasionally; 4 – Rarely; 5 – Never. The maximum total score of the question set is 25 points, the minimum is 5 points. Participants were assessed as being compliant with medication treatment when ≥ 20 points, and non-adherent when < 20 points [5].

- *Step 3:* Determine the relationship between medication adherence and: age, gender, place of residence, a person living with, duration of diabetes, type of medication being used to treat diabetes, comorbidities, hospital readmission time, HbA1C.

Data analysis: After collecting data, it is cleaned and entered into Microsoft Excel software. Then, analyses were performed using Stata 12.0 software. Percentages are presented in %, Determine the relationship based on Chi-square and Mann – Whitney test, the difference is statistically significant when $p < 0.05$.

Ethical issues: The study was approved by the Leadership of the Department of Endocrinology – 108 Military Central Hospital. Participants were clearly explained about the purpose and meaning of the study and voluntarily participated in the study. The information collected is only for research purposes, not used for other purposes, and is kept completely confidential, without affecting the health and interests of research subjects.

RESULTS

Table 1. General characteristics of subjects (n = 168)

Characteristic		n	%
Age group	≤ 50 years old	27	16.1
	51 - 69 years old	48	28.5
	> 70 years old	93	55.3
	Average: 72.4 ± 12.9 years old		
Gender	Male	111	66.0
	Female	57	34.0
Living area	City	120	71.4
	Countryside	48	28.6

The average age of the participants was 72.4 ± 12.9 years, Men accounted for 66.0% and mainly lived in cities, accounting for 71.4%.

Table 2. Pathological characteristics of participants (n = 168)

Characteristic		n	%
Duration of diabetes	< 5 years	12	7.1
	5 – 10 years	114	67.8
	> 10 years	42	25.1
Family history of having the disease	Have	51	30.3
	Are not	117	69.7
Drugs to treat diabetes using	Pills only	93	55.3
	Pills + insulin	57	33.9
	Insulin only	18	10.8
Co-morbidity	Yes	150	89.2
	No	18	10.8
HbA1C	Achieve goals	66	39.3
	Not achieve goals	102	60.7

The duration of diabetes was 5-10 years, accounting for the highest rate of 67.8%, the main treatment was pills. Up to 89.2% of patients had comorbidities.

Table 3. Time of hospital readmission of participants (n = 168)

Characteristic		n	%
Period of re-hospitalization	< 3 months	42	25.0
	3 - 6 months	99	58.9
	> 6 months	27	16.1
	Average: 5.6 ± 2.9 months		

The average period for second readmission was 5.6 ± 2.9 months, of which 3-6 months accounted for the highest rate of 58.9%.

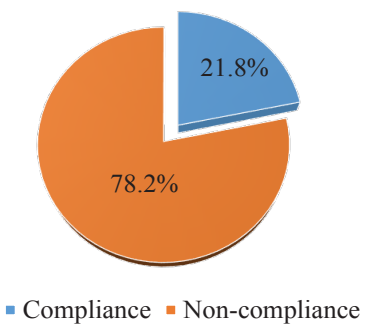

Figure 1. Medication adherence according to MARS - 5 in subjects (n = 168)

The rate of drug treatment compliance in patients was 21.8%, non-compliance accounted for 78.2%.

Table 4. Participants' adherence to MARS-5 medication (n = 168)

MARS-5	Always (n,%)	Frequent (n,%)	Sometimes (n,%)	Rare When (n,%)	Never (n,%)
Forgot to take medicine	3 (1.7)	9 (5.3)	87 (51.8)	45 (26.7)	24 (14.5)
Change to another medication other than the one the doctor prescribed	0 (0)	6 (3.5)	15 (8.9)	24 (14.2)	123 (73.4)
Arbitrarily reduce the dose to less than the dose prescribed by the doctor	0 (0)	6 (3.5)	54 (32.1)	15 (8.9)	93 (55.5)
Skip the dose of medicine the doctor has prescribed	0 (0)	3 (1.7)	3 (1.7)	60 (35.7)	102 (60.9)
Stop taking medicine for a while	21 (12.5)	9 (5.3)	30 (17.8)	84 (50.2)	24 (14.2)

Table 4 shows that patients occasionally forget to take medication, accounting for the highest rate of 51.8%, occasionally arbitrarily reducing the dose to less than the prescribed dose, accounting for 32.1%, rarely skipping doses and stopping medication for a while accounted for 35.7% and 50.2%, respectively.

Table 4. Relationship to medication adherence of participants (n = 168)

Characteristic		Medication compliance				p
		Adherence		Non-adherence		
		n	%	n	%	
Year old	< 70	30	40.0	45	60.0	0.02
	≥ 70	6	6.4	87	93.6	
Gender	Male	18	16.2	93	83.8	0.13
	Female	18	31.5	39	68.5	
Habitat	City	27	22.5	93	77.5	0.09
	Countryside	9	18.7	39	81.3	
Live with	Family	33	22.0	117	78.0	0.2
	Alone	3	20.0	15	80.0	
Duration of diabetes	< 5 years	9	75.0	3	25.0	0.07
	5 – 10 years	24	21.0	90	79.0	
	> 10 years	3	7.1	39	92.9	
Drugs to treat diabetes	Pills only	21	22.5	72	77.5	0.01
	Pills + insulin	0	0	57	100	
	Insulin only	15	83.3	9	16.7	
Co-morbidity	Yes	33	22.0	117	78.0	0.11
	No	3	20.0	15	80.0	
HbA1C	Achieve goals	ten	15.1	56	84.9	0.23
	Not reach target	26	25.4	76	74.6	
Time of readmission	< 3 months	6	14.2	36	85.8	0.42
	3 - 6 months	21	21.2	78	78.8	
	> 6 months	9	33.3	18	66.7	

There was a relationship between age and current medication and treatment compliance. The difference was statistically significant.

DISCUSSION

There were 168 subjects eligible to participate in the study, the average age was 72.4 ± 12.9 years old, the group ≥ 70 years old accounted for the highest proportion of 55.3%, the Male/Female ratio was 1.94/1.

Table 3 shows that readmission time from 3 to 6 months after discharge accounts for the highest rate of 58.9%, followed by >6 months accounting for 16.1% and < 3 months accounting for 25.0%. On average, subjects were hospitalized for about 5.6 ± 2.9 months. The earliest subject admitted to the hospital was 26 days, the latest 281 days. Compared to patients without diabetes, people with diabetes have a higher risk of being re-hospitalized with accompanying diseases caused by complications of diabetes such as heart failure, myocardial infarction, stroke, and eye diseases. ... along with that, poor blood sugar control also increases the risk of re-hospitalization. Research by Ostling (2017) conducted with a large sample size of 7,763 patients, including 1,940 subjects with diabetes, found: 26.4% of diabetic patients were readmitted to the hospital within 30 days after discharge, of which 74, 4% of blood sugar control did not reach the target (HbA1C > 10.0) [6]. Another study by Montero (2007), conducted in Spain, also found that diabetic patients re-hospitalized within 1 year had high blood sugar levels. Blood glucose level is much higher than normal [7].

From this, it can be seen that treatment compliance is very important to control the disease and limit the risk of re-hospitalization. Treatment adherence has been shown to be positively associated with a reduction in HbA1C levels, for every 10% increase in treatment adherence, HbA1C significantly decreases from 0.14 to 0.16% [8]. Medication adherence is considered one of the "3 pillars" combined with diet compliance and exercise regimen compliance in diabetes treatment. Our research found that only 21.8% of patients adhere well to drug treatment, while up to 78.2% do not comply. Some domestic studies such as Ong Tu My (2022) and Do Van Chien (2023) found that the drug treatment compliance rate was 84.3% and 61.7% respectively [9, 10]. The reason why the rate difference in my study is lower than in domestic studies is because our department uses a different set of medication adherence assessment tools and the subjects we choose are re-admitted patients. hospital due to poor blood sugar control, while two studies by Ong Tu My (2022) and Do Van Chien (2023) were outpatient treatment subjects. Up to 51.8% of patients interviewed answered that they sometimes forgot to take their medication. The reason may be because diabetes treatment regimens often combine many drugs and the average age of the research subjects. high causes memory loss. Accompanied by other diseases, patients often use many medications every day, causing confusion. When asked: Do they arbitrarily reduce the dose to less than the doctor's prescribed dose, 3.5% of subjects answered often and 32.1% answered that they sometimes arbitrarily reduce the dose. The reason for this action is that many patients, after taking medication for a period of time, see their blood sugar return to normal levels and feel that when they do not take medication, their body is still completely healthy. From that mentality, patients arbitrarily reduce the dose of oral medications or insulin injections. And up to 35.7% of patients occasionally stop taking their daily dose of medication, 12.5% stop taking the medication intermittently for

a while then take it again. This is due to many reasons, including: some patients, after a long period of treatment, their blood sugar does not reach the target, leading to depression because they think the treatment is ineffective. Along with that, diabetes treatment drugs often cause side effects, such as Metformine, the first-line drug prescribed, often causes diarrhea and weight gain, and SGLT-2 inhibitor drugs cause urinary tract infections. Urinary tract and hypoglycemia greatly affect the patient's psychology and health. Another reason may be that injecting insulin every day causes difficulty and the patient's fear of injections, along with always having to carry an injection pen with them both when going to work or going out, creating a feeling of inconvenience for the patient. .

Research finds that there is a relationship between age and current medication and treatment compliance. The compliance rate in the < 70 year old group is higher than the ≥ 70 year old group, the difference is statistically significant. Sheikh's (2021) study, conducted on 500 people with diabetes in Bangladesh, found that increasing age negatively affects treatment compliance [11]. Old age is a common cause of intellectual decline, research has shown. At age 65, only 5% of patients have dementia, but this number increases to 40% over age 85 [12]. This is the main cause of non-compliance with medication. Patients taking pill-only or insulin-only monotherapy had better adherence rates than the group taking a combination of both pills and insulin. A study by Huang (2021), conducted in China with a sample size of 483 subjects, found that the compliance rate of the insulin-only or pill-only groups was 38.0% and 49.5%, respectively. At that time, the group using a combination of insulin and pills had a compliance rate of only 12.5% [13]. treatment process, increasing the risk of complications. From this, it can be seen that enhancing health education during re-examination for patients and caregivers is extremely necessary. Patients need to understand very clearly that diabetes is a chronic disease that cannot be cured. Compliance with medication helps patients control blood sugar well, limiting the early appearance of complications such as kidney failure, eye disease, foot ulcers, stroke, myocardial infarction.

CONCLUSION

The medication compliance rate in diabetic patients readmitted to the hospital in the study was low, only 21.8%, of which patients forgot to take medication and arbitrarily reduced the dose and stopped using medication for a period of time accounting for a high percentage. Strengthening health education on medication adherence during follow-up examinations for patients and caregivers is extremely necessary to reduce the risk of hospital readmission, maintain blood sugar at normal levels, and minimize complications. complications caused by diabetes.

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