

The Correlation between Chronic Complications and Loneliness in the Elderly with Diabetes Mellitus at the Geriatric Clinic of Dr. Soetomo Hospital

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ABSTRACT

Introduction: Chronic complications of DM are interrelated with physical and socio-psychological changes in the elderly which then make the elderly feel inferior and lead to social isolation behavior. Social isolation due to chronic complications of DM which is influenced by factors such as geriatric syndrome, social stigma, and low self-esteem can make sufferers feel lonely. **Methods:** Observational analytic study with a cross-sectional approach through structured interviews of elderly patients aged ≥ 60 years with diabetes mellitus at the Geriatric Clinic of Dr. Soetomo Hospital in the period February to June 2024. **Results:** Fisher's Exact test analysis to determine the correlation between chronic complications of DM with loneliness obtained p value = 0.497 ($p > 0.05$). The results of crosstabulation to see the effect of geriatric syndrome in the correlation between chronic complications of DM and loneliness obtained p value = 0.011 ($p < 0.05$) in the group of elderly patients with chronic complications of DM. **Conclusion:** There was no significant correlation between chronic complications of DM and loneliness in elderly patients with diabetes mellitus at the Geriatric Clinic of Dr. Soetomo Hospital, but there was a significant effect of geriatric syndrome on loneliness in elderly patients suffering from chronic complications of DM.

Keywords: diabetes mellitus; chronic complications; loneliness; elderly.

INTRODUCTION

Diabetes mellitus (DM) is a chronic metabolic disease characterized by high blood glucose levels and hemoglobin hyperglycation, with or without glycosuria. The prevalence, comorbidity, and mortality of DM are higher in the elderly than in the young. In the elderly (≥ 60 years old), DM is becoming an alarming public health problem due to the high risk of chronic complications it can cause [1]. Chronic hyperglycemia causes damage and failure of various organs, especially the heart, blood vessels, eyes, kidneys, and nerves [2].

The results of the Basic Health Research in 2018 showed that the prevalence of DM in Indonesia in the age group 55–64 years was 6.3%, the age group 65–74 years was 6.03%, and the age group ≥ 75 years was 3.32% [3]. Based on data from the CDC, age > 70 years is the age group that most often suffers from complications of DM. The high mortality rate of patients with diabetes mellitus is often due to

chronic effects that occur due to complications from other organs [4].

Chronic complications of diabetes mellitus involve long-term vascular complications, which are classified into microangiopathy and macroangiopathy [5]. Microangiopathy is specific to DM as glucose is a major factor and affects all small blood vessels throughout the body, especially capillaries [6]. Complications of microangiopathy include diabetic retinopathy, diabetic nephropathy, and diabetic neuropathy. Macroangiopathy is not specific to DM as hyperlipidemia, hypertension, and smoking also play a role. Complications of macroangiopathy include heart disease, stroke, and peripheral vascular disease. Peripheral vascular disease can cause ulcers, claudication, and even amputation [7].

The elderly is someone aged ≥ 60 years who has entered the final stage of the life phase.

Elderly is characterized by a decline in various organ functions, cognitive functions, and socializing abilities [8]. Loneliness is defined as a complex set of feelings that includes reactions to the absence of intimate and social needs [9]. Diabetes mellitus can reduce the mobility of sufferers, cause difficulties in establishing social relationships, increase depression, and reduce social cohesion [10].

The elderly who suffer from various chronic complications of DM can experience poorer quality of life, longer hospitalization, more severe postoperative complications, higher costs of care, and a greater chance of death [4]. Elderly people with chronic complications of DM can feel high social anxiety [11]. Chronic complications of DM often lead to social stigma and affect patients' self-confidence. Low self-esteem and social stigma make a person want to isolate themselves [12].

Chronic complications of DM interfere each other with physical and socio-psychological changes in the elderly which then make the elderly feel inferior and lead to social isolation behavior [13]. Social isolation due to chronic complications of DM which is influenced by factors such as geriatric syndrome, social stigma, and low self-esteem can make sufferers feel lonely. Given the lack of research on the psychology of the elderly associated with chronic complications of DM, it is of interest to researchers to examine the correlation between chronic complications and loneliness in the elderly with DM.

METHODS

This study used an observational analytic study design with a cross-sectional approach that aims to analyze the correlation between chronic complications with loneliness in the elderly with diabetes mellitus at the Geriatric Clinic of Dr. Soetomo Hospital. This study was conducted on 46 subjects of elderly patients aged ≥ 60 years with diabetes mellitus who were undergoing outpatient care at the Geriatric Clinic of Dr. Soetomo Hospital in the period February to June 2024. The sampling technique used in this study was simple random sampling.

In this study, initial observations were made with structured interviews to find out the disease history and psychosocial history of the research subjects. The measurement of loneliness was measured by filling out the UCLA Loneliness Scale Version 3 questionnaire. The research sample used was patients who had met the screening exclusion criteria by filling out the AMTS questionnaire to assess memory and thinking disorders such as dementia, and the MINI Version ICD-10 questionnaire to assess the exclusion criteria for mental disorders such as psychosis or schizophrenia.

RESULTS

Based on the disease history of elderly patients with diabetes mellitus at the Geriatric Clinic of Dr. Soetomo Hospital, it was obtained that patients

suffering from chronic complications of DM amounted to 32 people (69.6%) and patients who do not suffer from chronic complications of DM amounted to 14 people (30.4%).

It is known that one patient can suffer from more than one chronic complication of DM (n = 46), and suffer from at most three chronic complications of DM.

TABLE 1: Distribution of Chronic Complications in Elderly Patients with Diabetes Mellitus.

Chronic Complications of DM	Frequency (n=46)	Percentage (%)
Microangiopathy Classification		
Diabetic Retinopathy	12	26,1%
Diabetic Nephropathy	11	23,9%
Diabetic Neuropathy	9	19,6%
Total	32	69,6%
Macroangiopathy Classification		
Coronary Heart Disease	7	15,2%
Stroke	9	19,6%
Blood Vessel Disease	4	8,7%
Total	20	43,5%

Based on the results in the table above, a higher frequency was obtained in the microangiopathy classification, which amounted to 69.6%, while the macroangiopathy classification amounted to 43.5%. The highest distribution for microangiopathy classification is diabetic retinopathy (26.1%), while the highest distribution for macroangiopathy classification is stroke (19.6%).

TABLE 2: Distribution of Geriatric Syndrome in Elderly Patients with Diabetes Mellitus.

Geriatric Syndrome	Frequency (n=46)	Percentage (%)
Immobility	6	13,0%
Instability	12	26,1%
Intellectual impairment	3	6,5%
Incontinence	0	0,0%
Isolation	6	13,0%
Impotence	1	2,2%
Immunodeficiency	3	6,5%
Infection	2	4,3%
Inanition	0	0,0%
Impecunity	1	2,2%
Impaction	1	2,2%
Insomnia	7	15,2%
Impairment of hearing and vision	8	17,4%
Iatrogenic disorders	0	0,0%

It is known that one patient can suffer from more than one geriatric syndrome (n = 46).

The highest distribution of patients suffering from geriatric instability syndrome was obtained, as many as 12 people (26.1%).

TABLE 3: Distribution of Psychosocial History in Elderly Patients with Diabetes Mellitus.

Psychosocial History		
Living Status	Frequency (n)	Percentage (%)
With Family	42	91,3%
Living Alone	4	8,7%
Total	46	100%
Social Stigma		
Frequency (n)	Percentage (%)	
Not Received	38	82,6%
Received	8	17,4%
Total	46	100%
Self-Esteem		
Frequency (n)	Percentage (%)	
Not Lowering	41	89,1%
Lowering	5	10,9%
Total	46	100%
Social Isolation		
Frequency (n)	Percentage (%)	
Have Not Done	41	89,1%
Have Done	5	10,9%
Total	46	100%

Based on the results of psychosocial history, patients who live with family obtained the highest distribution for living status (91,3%). Higher frequencies were also obtained in patients who have not received social stigma (82,6%), had no lowering in self-esteem (89,1%), and have not done social isolation (89,1%) while suffering from diabetes mellitus.

TABLE 6: Effect of Geriatric Syndrome in the Correlation of DM Chronic Complications with Loneliness.

Chronic Complications of DM			Not Lonely		Lonely		Total	p-value
			(n)	(%)	(n)	(%)		
Not Suffering	Geriatric Syndrome	Not Suffering	3	60.0%	2	40.0%	5	0,505
		Suffering	8	88.9%	1	11.1%		
Total			11	78.6%	3	21.4%	14	
Suffering	Geriatric Syndrome	Not Suffering	12	92.3%	1	7.7%	13	0,011
		Suffering	9	47.4%	10	52.6%		
Total			21	65.6%	11	34.4%	32	

p value = 0.011 is obtained in the group of elderly patients suffering from chronic complications of DM and p value = 0.505 is obtained in the group of elderly patients who do not suffer from chronic complications of DM, meaning that there is a significant effect of geriatric syndrome on loneliness in elderly patients suffering from chronic complications of DM (p < 0.05).

TABLE 4: Distribution of Loneliness Level based on UCLA Loneliness Scale Version 3 Score.

Loneliness Level	Frequency (n)	Percentage (%)
Not Lonely (score 20-34)	32	69,6%
Low (score 35-49)	11	23,9%
Medium (score 50-64)	2	4,3%
High (score 65-80)	1	2,2%
Total	46	100%

The level of loneliness was measured through the UCLA Loneliness Scale Version 3 instrument consisting of 20 items. Based on the measurement results with a 4-point Likert scale model, it was found that the highest distribution for loneliness level is people with a score of 20–34 included in the not lonely group (69.6%).

TABLE 5: Analysis of the Correlation between Chronic Complications of DM and Loneliness.

Chronic Complications of DM	Not Lonely		Lonely		p-value
	(n)	(%)	(n)	(%)	
Not Suffering	11	78,6%	3	21,4%	0,497
Suffering	21	65,6%	11	34,4%	
Total	32	69,6%	14	30,4%	

Based on the Fisher's Exact test results, it can be assessed that elderly patients who suffer from chronic complications of DM and those who do not suffer from chronic complications of DM are more likely not to feel lonely. Based on the table above, p-value = 0.497 (p > 0.05) is obtained, meaning that there is no significant correlation between chronic complications of DM and loneliness.

It can be seen from the table above, that the frequency of patients with chronic complications of DM who suffer from geriatric syndromes who feel lonely amounted to 10 people (52.6%). It is known that one patient can suffer from more than one chronic complication of DM and more than one geriatric syndrome (n = 10). Based on the crosstabulation results in the table below, it was found that the largest distribution of elderly patients with chronic complications of DM who feel lonely suffer from geriatric instability syndrome (40.0%), also impairment of hearing and vision (40.0%).

TABLE 7: Distribution of Geriatric Syndrome in Patients with Chronic Complications of DM who Feel Lonely.

Geriatric Syndrome	Diabetic Retinopathy		Diabetic Nephropathy		Diabetic Neuropathy		Coronary Heart Disease		Stroke		Blood Vessel Disease		Total (n=10)
	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)	
Immobility	1	50,0	0	0,0	0	0,0	0	0,0	1	50,0	1	50,0	2
Instability	2	50,0	2	50,0	0	0,0	1	25,0	2	50,0	1	25,0	4
Intellectual impairment	1	100	0	0,0	0	0,0	0	0,0	0	0,0	1	100	1
Isolation	2	100	0	0,0	0	0,0	0	0,0	0	0,0	1	50,0	2
Infection	1	100	0	0,0	1	100	0	0,0	1	100	0	0,0	1
Impecunity	1	100	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	1
Impaction	1	100	0	0,0	0	0,0	0	0,0	0	0,0	1	100	1
Insomnia	2	66,7	0	0,0	1	33,3	1	33,3	1	33,3	1	33,3	3
Impairment of hearing and vision	2	50,0	1	25,0	1	25,0	0	0,0	1	25,0	0	0,0	4

DISCUSSIONS

Based on the Fisher's Exact test analysis with a significance of 0.05, the p-value = 0.497 ($p > 0.05$). It can be concluded that there is no significant correlation between chronic complications of DM and loneliness in elderly patients with diabetes mellitus at the Geriatric Clinic of Dr. Soetomo Hospital in the period February to June 2024.

These results are not in line with previous research conducted in Poland, which states that significantly higher loneliness was observed in patients with chronic complications of diabetes mellitus (retinopathy, nephropathy, and neuropathy). It is stated that the subjects in their study felt "alone" and "socially ostracized" because they had diabetes mellitus, often feeling a lack of understanding from friends, family, health workers, and society [15].

Based on the results of observations and structured interviews conducted by researchers in this study, most of the research subjects showed similar psychosocial characteristics. Most patients live with family, and only very few patients live alone, either separated home from relatives or living in nursing homes. This result shows that Indonesian culture is still strong in terms of caring for elderly parents.

Effect of Geriatric Syndrome

In this study, a p-value = 0.011 is obtained, meaning that there is a significant effect of geriatric syndrome on loneliness in elderly patients suffering from chronic complications of DM ($p < 0.05$). Based on the findings of researchers in this study, patients with chronic macroangiopathy complications, especially post-stroke, or recurrent stroke events, tend to suffer from geriatric instability syndrome, even immobilization. Often the reason why patients find it difficult to establish social relationships or are forced to confine themselves is due to immobilization conditions caused by chronic macroangiopathy complications such as stroke and diabetic ulcers.

Based on the results of a previous study, chronic complications of macroangiopathy decrease hand grip strength, skeletal muscle mass index, and walking speed [16]. Psychological effects of falls caused by postural instability in the elderly include post-fall anxiety, depression, and decreased ability to socialize [17]. Based on the results of previous research, the highest percentage of loneliness in the elderly related to physical health variables is visual and hearing impairment which makes the elderly limited in carrying out daily activities and causes feelings of loneliness, because it is difficult to build relationships and integrate with others [18].

Effect of Social Stigma

Based on the results of qualitative research conducted in Australia, 84% of subjects reported that they believed that type 2 DM was stigmatized or reported evidence of stigmatization. Subjects' experiences of social stigma included feeling blamed by others for the disease, being exposed to negative stereotypes, being discriminated against, and having limited opportunities in life [19]. Due to stigmatization, patients with diabetes mellitus are more at risk of experiencing mental health problems, such as psychological distress and depression [20]. These results are not in line with the findings of researchers in this study, most patients thought that diabetes mellitus is not a disease that can make patients shunned by the surrounding environment or socially alienated. According to the results of observations and structured interviews conducted by researchers, there is no social stigma from the community in the form of discrimination that makes people with diabetes mellitus feel ashamed and blamed by others for their disease. Effect of Low Self-Esteem Not all patients diagnosed with diabetes mellitus experience a state of crisis. Patients can quickly adapt to their disease, accept that they have diabetes mellitus, and know that many people suffer from the same disease [21].

In this study, according to the results of observations and structured interviews conducted by researchers, the low self-esteem or lack of confidence experienced by a small number of patients was triggered by anxiety because suffering from diabetes mellitus and its chronic complications had reduced their quality of life, such as previously working to being unable to work anymore.

Effect of Social Isolation

Social relationships in patients with diabetes mellitus will deteriorate over time, especially in patients who have had diabetes mellitus for more than 10 years, there is a high probability of limited activity ability, pain, or discomfort. This has a negative impact on daily life and can even increase feelings of sadness and social isolation [22].

Based on the results of observations and structured interviews conducted by researchers in this study, a small number of patients had experienced social isolation due to immobilization or social anxiety when they first suffered from chronic complications of diabetes mellitus that can be seen physically, such as diabetic ulcers.

Most of the other patients who never experienced social isolation showed similar psychosocial characteristics. If there were no physical limitations that hindered social activities such as instability and immobilization, no anxiety disorders that triggered guilt, shame, and low self-esteem, as well as the absence of social stigma in the form of discrimination from society, the patients felt no urgency to do social isolation. Extended Family Culture in Indonesia.

In previous research, it is mentioned that the extended family culture that is still developing in Indonesia allows the elderly to live with their families. The elderly generally still have a fairly high position as parents who must be valued and respected [23]. In this study, both the elderly who suffer and do not suffer from chronic complications of DM were more likely not to feel lonely. This result may be influenced by protective factors for the elderly, namely the extended family culture which is still a local wisdom in Indonesia.

Most patients have a good relationship with their family. A small number of patients who live alone are still accompanied by their relatives to the hospital. Good support from the family by taking them to the hospital and motivating them to recover makes patients not feel alone in facing their illness and makes it easier for patients to maintain social relationships, even though the chronic complications of DM they suffer have reduced their quality of life.

CONCLUSIONS

From 46 research subjects, most elderly patients with diabetes mellitus suffer from chronic complications of DM (69.6%), with the most microangiopathy classification being diabetic retinopathy (26.1%) and the most macroangiopathy classification being stroke (19.6%). Fisher's Exact test analysis to determine the correlation between

chronic complications of DM with loneliness obtained p value = 0.497 ($p > 0.05$). The results of crosstabulation to see the effect of geriatric syndrome in the correlation between chronic complications of DM and loneliness obtained p value = 0.011 ($p < 0.05$) in the group of elderly patients with chronic complications of DM. There was no significant correlation between chronic complications of DM and loneliness in elderly patients with diabetes mellitus at the Geriatric Clinic of Dr. Soetomo Hospital in the period February to June 2024, but there was a significant effect of geriatric syndrome on loneliness in elderly patients suffering from chronic complications of DM.

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