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Analysis Of Depression in Stroke Patients Using BDI-II (Beck Depression Index-II)

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Abstract

Purpose: The purpose of this study was to describe the level of depression among stroke patients using the Beck Depression Inventory-II (BDI-II) instrument. **Methods:** This study employed a prospective cohort design conducted over approximately three months. The sample consisted of 40 stroke patients treated in the Mawar ward of Ciamis Hospital. Participants were selected using a purposive sampling technique. Data were collected using the BDI-II questionnaire to assess depression levels. The study was conducted from March to May 2023. **Results:** The findings showed that out of 40 ischemic stroke patients, 12 patients experienced depression. Among them, 8 patients (20%) had mild depression, 3 patients (7.5%) had moderate depression, and 1 patient (2.5%) had severe depression. The most frequently reported symptoms were related to anxiety and sadness. **Conclusions:** Depression is present among stroke patients with varying levels of severity and may be influenced by multiple factors. Psychological symptoms such as anxiety and sadness are commonly experienced. Therefore, early screening and appropriate psychological support are important in the management of stroke patients.

Keywords: BDI-II, depression, stroke

Introduction

Stroke is a cerebrovascular disorder that can cause brain death due to reduced blood flow and oxygen resulting from blockage or rupture of blood vessels (Saima Sharif, 2020). Stroke occurs when a blockage in blood vessels disrupts nerve function. Blood clots in the brain can obstruct arteries, rupture vessels, and cause bleeding, which may lead to sudden death due to insufficient blood flow and oxygen caused by vascular obstruction or rupture (Kuriakose & Xiao, 2020).

Stroke is the second leading cause of death worldwide. Each year, approximately 13.7 million new stroke cases occur globally, resulting in around 5.5 million deaths. Over the past 15 years, stroke-related mortality has been higher in low-income countries and more prevalent among men. However, mortality among women with stroke is slightly higher, although the difference is not statistically significant (Feigin et al., 2022).

In Indonesia, stroke prevalence has increased considerably. According to national health data (RISKESDAS, 2018), stroke prevalence rose from 7% in 2013 to 10.9% in 2018. By age

group, prevalence was 3.7% (34–44 years), 14.2% (45–54 years), 32.4% (55–64 years), 45.3% (65–74 years), and 50.2% (>75 years). Stroke cases are more common in urban areas (63.9%) than rural areas (36.1%). At the provincial level, West Java reported a prevalence of 11.4%. Routine health examinations in Ciamis were conducted by 21.87% of residents, while 30.7% did not undergo regular health checks. Based on medical records from Ciamis Regional Hospital, 355 stroke patients were treated in the Mawar ward in 2021, including 177 patients with infarction and hemorrhagic stroke.

Depression is a disorder that affects feelings, behavior, and thinking patterns, causing sadness or loss of interest in previously enjoyable activities, decreased physical ability, and emotional problems (American Psychiatric Association, 2022). Declines in cognitive and motor function in stroke patients often lead to dependence on others, which can trigger depression. Mental status changes, cognitive impairment, and speech disorders may cause patients to feel anxious about changes in their condition. Depression in stroke patients is characterized by mood changes, self-blame, anxiety, and related symptoms (Purba & Utama, 2019).

Globally, depression affects approximately 3.8% of the population, including 5.0% of adults and 5.7% of individuals over 60 years old, totaling about 200 million people (Wati & Asnawati, 2022). Among stroke patients, depression occurs in approximately 20–50% of cases and may develop as early as the second week or within 3–6 months after stroke onset, or even sooner (Sinaga & Kurniawati, 2021). One commonly used instrument to measure depression is the Beck Depression Inventory-II (BDI-II), developed in the 1960s by Aaron T. Beck. It assesses emotional, motivational, physical, and cognitive characteristics of depression (Ihsanuddin & Taurusta, 2021). BDI-II was designed to estimate depressive symptoms based on DSM-IV criteria and provides data that can assist in planning psychotherapeutic interventions and monitoring progress.

Depression is often influenced by chronic illnesses such as stroke. Stroke patients who experience depression may find rehabilitation difficult, become easily irritated, show behavioral changes, and feel anxious. Therefore, depression must be treated promptly, especially in patients undergoing rehabilitation, because untreated depression can interfere with and slow recovery (Bagaskoro & Pudjonarko, 2017). According to Masdeu and Solomon, stroke patients frequently develop psychological disorders due to significant changes resulting from physical disability and communication difficulties, which impair their ability to adapt. Depression in stroke patients usually occurs between one month and one year after stroke onset, or even earlier, with an estimated prevalence of 20–50% (Hutagaluh, 2019). Therefore, the author is interested in conducting a study entitled:Analysis of Depression in Stroke Patients Using BDI-II (Beck Depression Inventory-II).

Methods

This study employed a quantitative approach with a comparative research design using a prospective cohort framework. The descriptive correlational design aimed to describe depression levels among hospitalized stroke patients at Ciamis Regional General Hospital. The population consisted of all stroke patients admitted to the Mawar ward of Ciamis Regional General Hospital. Sampling was conducted using a purposive sampling technique, in which samples were selected based on specific characteristics relevant to the research objectives (Sugiyono, 2017). Essentially, purposive sampling in this study functioned as total sampling, meaning all eligible members of the population who met the predetermined criteria were included as research participants.

Data collection utilized both primary and secondary data sources. Primary data were obtained directly from respondents, while secondary data were collected from existing medical records. Initially, patients were asked to sign informed consent indicating their willingness to

participate. To assess depression levels, respondents were asked to complete an observation sheet using the BDI-II method. Participants filled out the questionnaire according to how they felt at that moment, and the data were monitored periodically until discharge or death.

The research instrument consisted of a questionnaire, specifically the Beck Depression Inventory-II (BDI-II). The BDI-II contains 21 items categorized into four score levels: normal (0–13), mild depression (14–19), moderate depression (20–28), and severe depression (29–63) (Rosdiana, 2020).

Results

Based on the findings of the study conducted in the Mawar ward of Ciamis Regional General Hospital, this research describes respondents' characteristics, including age, gender, educational status, occupation, marital status, and history of recurrent stroke.

Respondent Characteristics

The univariate analysis in this study describes respondent characteristics, including age, education level, occupation, and demographic variables, analyzed using frequency distribution formulas through a computerized system. The results are presented as follows:

Table 1. Respondent Characteristics

Variable	Frequency (F)	Percentage (%)
Age		
46–60 years	16	40%
61–75 years	20	50%
>75 years	4	10%
Gender		
Male	23	57.5%
Female	17	42.5%
Education		
Elementary School	24	60%
Junior High School	12	30%
Senior High School	1	2.5%
Higher Education	3	7.5%
Occupation		
Unemployed	10	25%
Housewife	9	22.5%
Entrepreneur/Trader	9	22.5%
Civil Servant	1	2.5%
Others	11	27.5%
Marital Status		
Married	31	77.5%
Widow	4	10%
Widower	5	12.5%
Recurrent Stroke		
Yes	8	20%

Variable	Frequency (F)	Percentage (%)
No	32	80%

Based on Table 1. the characteristics of the 40 respondents show that the majority were aged 61–75 years, totaling 20 individuals (50%). In terms of gender, most respondents were male, with 23 individuals (57.5%). Regarding educational level, the largest proportion had completed elementary school, totaling 24 individuals (60%). Based on occupation, the most common category was "other occupations," with 11 individuals (27.5%). In terms of marital status, most respondents were married, totaling 31 individuals (77.5%). Furthermore, based on stroke history, the majority experienced their first stroke episode, totaling 32 individuals (80%).

Table 2. Frequency of Depression Levels in Stroke Patients

Variable	Frequency (F)	Percentage (%)
Type of Stroke		
Ischemic Stroke	40	100%
Level of Depression		
Normal	28	70%
Mild	8	20%
Moderate	3	7.5%
Severe	1	2.5%
Total	40	100%

Based on Table 2. all respondents were diagnosed with ischemic stroke, totaling 40 individuals (100%). Regarding depression levels, 28 respondents (70%) were categorized as normal, 8 respondents (20%) had mild depression, 3 respondents (7.5%) had moderate depression, and 1 respondent (2.5%) had severe depression.

Discussion

1. Respondent Characteristics

a. Age

In this study, the ages of stroke patients ranged from 46 years to over 75 years. The results showed that respondents aged 46–60 years totaled 16 individuals (40%), those aged 61–75 years totaled 20 individuals (50%), and those aged over 75 years totaled 4 individuals (10%). These findings are consistent with Susilawati & Hk (2018), who reported that the majority of stroke patients were over 55 years old (61 individuals; 63.53%), while those under 55 years accounted for 35 individuals (6.5%). Age above 55 years is considered elderly, a stage in which individuals are more vulnerable to declining organ function, including thinning and fragility of blood vessels.

b. Gender

The study showed that 23 respondents (56.1%) were male and 17 respondents (41.5%) were female. This finding is consistent with Budi et al. (2020), who reported that stroke prevalence was higher in men (7.1%) than in women (6.8%). According to Nurlan (2020), men are at greater risk of stroke because they tend to engage more frequently in health-risk

behaviors such as smoking and alcohol consumption. Hormonal factors and menstrual cycles in women may also contribute to healthier cardiovascular circulation.

c. Education

The results showed that the majority of respondents had elementary-level education, totaling 24 individuals (58.5%), followed by junior high school (12 individuals; 2.3%), senior high school (1 individual; 2.4%), and higher education (3 individuals; 7.3%). These findings are consistent with Nurhidayat et al. (2021), who found that most stroke patients had elementary-level education (63% of ischemic patients and 57% of hemorrhagic patients). According to Notoatmodjo (2014), stroke risk may be associated with insufficient knowledge about the disease, and education level significantly influences knowledge acquisition. Lower educational attainment may limit critical thinking and understanding of health information, whereas higher education generally leads to better knowledge.

d. Occupation

The study found that respondents' occupations included unemployed (10 individuals; 25%), housewives (9 individuals; 22.5%), self-employed/traders (9 individuals; 22.5%), civil servants (1 individual; 2.5%), and other occupations (11 individuals; 27.5%). Laily (2017) reported that 12 patients (63.5%) were employed and 32 patients (72.7%) were unemployed, and mortality among stroke patients is associated with employment and family economic status. Mortality tends to be higher among individuals with low economic status, which may increase stress levels.

e. Marital Status

The results showed that most respondents were married (31 individuals; 77.5%), followed by widows (4 individuals; 10%) and widowers (5 individuals; 12.5%). Purba & Utama (2019) also reported that most stroke patients were married (84.2%), while only 2.6% were unmarried. Married stroke patients may be better able to maintain basic physical activity, especially among the elderly, because marital relationships provide mutual social support that can help prevent physical disability.

f. Recurrent Stroke

The results indicated that 8 respondents (20%) experienced recurrent stroke, while 32 respondents (80%) experienced their first stroke episode. Rahayu (2020) reported that recurrent stroke may occur within six months after the first stroke and carries a higher mortality risk than initial stroke.

2. Frequency of Depression in Stroke Patients Using BDI-II

The results showed that 12 ischemic stroke patients (30%) experienced depression, with an average age above 53 years. Anggraeni et al. (2021) stated that depression among elderly stroke patients occurs due to physiological and psychological physical changes, making them more vulnerable to depressive symptoms.

These findings are consistent with Tering & Putri (2023), who reported that among stroke patients, 39.7% had mild depression, 39.7% were normal, and 20.5% had moderate depression. Depression may occur due to brain infarction processes or feelings of helplessness caused by stroke. Depression levels may also be influenced by several factors, including brain lesions, gender, history of depression, and family social environment (Lindsay et al., 2019).
One cause of depression is organobiological factors that affect immune resistance, nervous system function, hormonal balance, and immune system performance. Reduced immune resistance may prolong the healing process (Wibowo, 2016).

Lökk & Delbari (2010) found no relationship between stroke severity and depression incidence, but reported that about 50% of stroke survivors may experience depression more than three months after stroke. However, depression may also occur within days after stroke due to functional decline. Similarly, Dudung et al. (2015) found no significant relationship between stroke diagnosis category and depression, suggesting that depression may result from disability or helplessness caused by stroke.

3. Depression Profile Based on BDI-II Item Responses

Based on BDI-II observation results, the most frequent depressive symptoms were anxiety (22 points), sadness (19 points), and discouragement (15 points). Persistent sadness is an early indicator of depression, followed by loss of interest in previously enjoyable activities. Widiyanto et al. (2022) reported that 30–72% of stroke patients experience significant depressive and anxiety symptoms, highlighting the need for interventions to reduce these symptoms.

Stroke patients with depression tend to experience prolonged sadness, decreased appetite, anxiety about the future, and loss of interest in activities, which can hinder treatment. They may also develop negative perceptions of the future due to significant life changes, leading to feelings of hopelessness, pessimism, negative thinking, and emotional instability (Lumongga, 2016).

Conclusion

Based on the results of the study entitled *"Analysis of Depression in Stroke Patients Using BDI-II (Beck Depression Inventory-II)"*, it can be concluded that depression was identified in 12 out of 40 respondents diagnosed with ischemic stroke. Furthermore, the findings from the BDI-II assessment indicated that the most frequently reported depressive symptoms among patients were anxiety, sadness, and feelings of discouragement, highlighting the presence of significant psychological distress in stroke patients.

Recommendations

Based on the findings of this study, the most urgent recommendation is directed toward healthcare services, where providers are strongly encouraged to integrate routine depression screening, such as the use of the BDI-II instrument, into standard stroke care to enable early identification and management of depression, thereby improving recovery outcomes and patients' quality of life. In addition, patients are expected to actively manage their psychological condition by recognizing and controlling symptoms of depression to support optimal recovery. Educational institutions are also encouraged to utilize these findings as a reference to enrich academic knowledge, particularly in medical surgical nursing related to psychological aspects of stroke patients. Furthermore, future researchers are recommended to explore and develop additional variables associated with depression in stroke patients, including psychosocial and environmental factors, to provide a more comprehensive understanding and support the development of effective interventions.

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