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ORIGINAL RESEARCH

LEVEL OF DEPENDENCE OF STROKE PATIENTS BASED ON THE BARTHEL INDEX SCORES IN ACTIVITY DAILY LIVING

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ABSTRACT

Stroke is a major cause of long-term disability resulting in the inability to perform daily activities (ADL). Various daily activity assessment scales have been used for stroke patients including the Barthel Index. This study aims to determine the level of dependence of stroke patients based on the Barthel index score in daily living activities. This research is a descriptive study, where the research sample is stroke patients in the working area of the Kedundung Public Health Center, Mojokerto City, totaling 60 people using a consecutive sampling technique. Data collection using the Barthel index instrument to assess the ability of ADL. Data were analyzed using frequency distribution. The results showed that most of the respondents had mild dependence, namely 78.4% and 13.3% of respondents were independent in ADL abilities. The severity of the respondent's dependence on performing ADL ability also depends on the severity of stroke symptoms. Patients with mild stroke may also experience ADL dependence in daily life. Appropriate and effective evaluation of ADL in stroke patients can be used as a basis for decision-making in treatment, rehabilitation, and nursing actions.

Keywords

Activity Daily Living, Barthel index score, stroke

INTRODUCTION

Stroke is a major cause of long-term disability resulting in the inability to carry out daily activities, emotional mental disorders, and decreased productivity (Nur et al., 2018) (Winstein et al., 2016)(Tu et al., 2013). Post-stroke patients suffer from neurological deficits. The deficit depends on the location and size of the lesion. Post Neurological deficits of stroke can affect motor and/or non-motor, but motor deficits are more common. Motor dysfunction can limit the patient's ability to perform activities of daily living (ADL) and lead to dependence. Disability in the patient will lead to decreased participation / social function (Brewer et al., 2013). Furthermore, the inability to perform ADL due to stroke can affect multi-system dysfunction in the body (Kārkliņa et al., 2021). Various ADL rating scales have been used for stroke patients including the Barthel Index (BI)(Mahoney & Barthel, 1965)(Duffy et al., 2013) (Y.-C. Lee et al., 2017) and the modified Barthel Index (MBI) (Shah et al., 1989).

By 2020, 1 in 6 deaths from cardiovascular disease will be due to stroke

(CDC, 2020). Each year, more than 795,000 people in the United States have a stroke. About 610,000 of them had a first stroke (Tsao et al., 2022). The increasing prevalence of stroke is estimated at 3.4 million people between 2012 and 2030 (Ovbiagele et al., 2013) (Pearson et al., 2013). The results of the Indonesian Basic Health Research in 2018 showed that the prevalence of stroke in Indonesia was 10.9 per mil, while in East Java Province it was above the national prevalence, which was around 12 per mil. (Kemenkes RI, 2019). Research result (Oktari et al., 2020) showed that the majority of stroke patients' ADL abilities were mild dependent as much as 32.1%, moderate dependence as much as 26.4%, 17.0% experiencing total dependence and 9.4% being independent. Based on the Barthel Index score, 18 of 31 patients were dependent on ADL (Whitiana et al., 2017), 51.4% of respondents have ADL dependency (Diyanto et al., 2016).

Stroke is a disorder that shows neurological symptoms that occur suddenly resulting from damage to brain tissue due to disruption or reduced vascularization to the brain caused by blockage or rupture of brain blood vessels, causing a stroke. (S. Lee, 2018). Stroke survivors will experience some form of hemiparesis or hemiplegia during the sub-acute and/or chronic stages and disturbances in other physical functions including speech, swallowing, sensation, balance and coordination so that subsequent stroke sufferers need some form of assistance in performing activities of daily living. (Brenner, 2018). Complications that can occur in stroke patients if they do not follow the rehabilitation program are the occurrence of immobilization disorders which can cause muscle weakness, atrophy, and contractures. The final impact of stroke sufferers can cause the patient to experience body weakness for a long time to disability until the end of his life (Kemenkes RI, 2015) (Jung, 2019).

Appropriate and effective evaluation of ADL in stroke patients can be used as a basis for decision making in treatment, rehabilitation, and nursing actions. (Yang et al., 2021). Interventions must be tailored to the patient's condition and needs and pay attention to safety and comfort in the process. One indicator of the condition of post-stroke patients who need rehabilitation is the decreased ability to perform activities of daily living (ADL).(Yang et al., 2021). The modified Barthel Index was developed to achieve greater sensitivity, and its internal consistency has been confirmed for use among stroke patients (Hong et al., 2016). BI and MBI have their respective advantages, suitable for assessing ADL in the clinic (Yang et al., 2021).

METHOD

This research is a descriptive study, where the research sample is stroke patients in the working area of the Kedundung Public Health Center, Mojokerto City, totaling 60 people who signed the consent form using consecutive sampling technique. Data collection using the Barthel index instrument to assess the ability of ADL. The Barthel Index is a scale that measures dependence in activities of daily living (ADL) in stroke patients. The Barthel index assesses mobility, continence and self-care functions such as feeding, bathing, grooming, dressing, bowel control, bladder control, toilet use, transfers (bed to chair and back), mobility on level surfaces and stairs. The minimum score of the Barthel index is 0 and the maximum is 20. The interpretation of the Barthel index score is as follows, independent (20) and dependent (0-19). The degree of dependence on the Barthel index was divided into categories: mild dependent (12-19), moderately dependent (9-11), severe dependence (5-8), and fully dependent (0–4) (Wade & Hewer, 1987). Data were analyzed using frequency distribution.

RESULTS

Table 1. Characteristics of Respondents (n = 60)

Characteristics	f	%
Age (years old)		
< 40	0	0
40 – 44	0	0
45 – 49	4	6,7
50 – 54	26	43,3
55 – 59	30	50
≥ 60	0	0
Gender		
Female	32	53,3
Male	28	46,7
Education Level		
Elementary school	1	1,6
Junior high school	8	13,4
Senior high school	48	80
Diploma / Bachelor	3	5
Occupation		
Working	42	70
Not working	18	30

Based on the results of the study, it was found that some respondents were aged 55 - 59 years (50%) and a small proportion of respondents were aged 40 - 44 years (6.7%), based on gender, female respondents were more than 53.3%, most of the respondents had senior education. high school (80%) and most of the respondents work (70%).

Table 2. Distribution of ADL Capabilities (n=60)

ADL capabilities	f	%
Independent	8	13,3
Slight Dependence	47	78,4
Moderate Dependence	5	8,3
Severe Dependence	0	0
Total Dependence	0	0

The results showed that most of the respondents had mild dependence, namely 78.4% and 13.3% of respondents were independent in ADL abilities.

Table 3. Distribution of ADL Ability Based on Characteristics of Respondents (n=60)

	Independent	Slight Dependence	Moderate Dependence	Severe Dependence	Total Dependence	Total
Age (years old)						
< 40	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
40 – 44	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
45 – 49	4 (6,7%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	4 (6,7%)
50 – 54	3 (5,0%)	21 (35,0%)	2 (3,3%)	0 (0%)	0 (0%)	26 (43,3%)
55 – 59	1 (1,7%)	26 (43,3%)	3 (5,0%)	0 (0%)	0 (0%)	30 (50%)
≥ 60	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Gender						
Female	2 (3,3%)	27 (45,0%)	3 (5,0%)	0 (0%)	0 (0%)	32 (53,3%)
Male	7 (11,7%)	19 (31,7%)	2 (3,3%)	0 (0%)	0 (0%)	28 (46,7%)
Education Level						
Elementary school	0 (0%)	1 (1,6%)	0 (0%)	0 (0%)	0 (0%)	1 (1,7%)
Junior high school	0 (0%)	3 (5,0%)	5 (8,3%)	0 (0%)	0 (0%)	8 (13,3%)
Senior high school	8 (13,3%)	39 (65%)	1 (1,7%)	0 (0%)	0 (0%)	48 (80%)
Diploma / Bachelor	0 (0%)	3 (5,0%)	0 (0%)	0 (0%)	0 (0%)	3 (5,0%)
Ocupation						
Working	7 (11,7%)	32 (53,3%)	3 (5,0%)	0 (0%)	0 (0%)	42 (70,0%)
Non Working	1 (1,7%)	15 (25,0%)	2 (3,3%)	0 (0%)	0 (0%)	18 (30,0%)

The results showed that at the age of 40 - 59 years there were respondents who did ADL independently with a minimum number of respondents, namely 6.7% of respondents at the age of 45 -49 years, 5.0% of respondents in the age range of 50 - 54 years and 1, 7% of respondents aged 55 – 59 years. Most respondents experienced slight dependence in doing ADL in the age range of 50 – 59 years. Based on the gender of the respondents who can do ADL independently, the most respondents who are male are 7 respondents (11.7%) while the most female respondents have slight dependence. Respondents who can do ADL independently are mostly working respondents, which is 11.7% as well as slight dependence which is mostly owned by working respondents, which is 53.3%.

DISCUSSION

Based on the results of the study, it was found that most of the respondents had mild dependence and a small number of respondents were still able to be independent in doing ADL. Most of the respondents who experience slight dependence are in the age range of 50 – 59 years and are female. Age and gender are non-modifiable risk factors for stroke. Motor impairment is the most common problem in stroke, a direct result of the lack of signal transmission from the cerebral cortex (Divani et al., 2011). The motor function deficit significantly affects the patient's mobility and activities of daily living and limits other professional activities (Lui & Nguyen, 2018). The 55-64 year age group is the largest age group experiencing stroke and this age is considered to be of productive age, so that a stroke can limit productive activities due to decreased function or motor weakness that causes a decrease in extremity function. (Whitiana et al., 2017).

Post-stroke disability has been associated with various factors, including older age (Wurzinger et al., 2021)(Pettersen et al., 2002), comorbidity (Pettersen et al., 2002), cognitive impairment (Zietemann et al., 2018), and severity at onset (Thijs et al., 2016). Patients with mild stroke can experience ADL dependence in daily life (Saad et al., 2021). Patients with ADL dependence after stroke tend to have more long-term dependence (Wurzinger et al., 2021) (Pettersen et al., 2002)(Hankey et al., 2002). The results of the study by Kwakkel and Woldak evaluated that patients with more severe stroke experienced greater ADL dependence (Kwakkel et al., 2011) (Woldag et al., 2006).

The severity of the respondent's dependence in carrying out ADL abilities also depends on the severity of the stroke symptoms felt. Respondents are also stroke patients who have undergone medical rehabilitation so that no one experiences severe or total dependence, because medical rehabilitation trains the muscle strength of stroke patients so that they can carry out their functions in carrying out daily activities. Mild dependence occurs if the respondent is unable to perform a few tasks, namely eating where the respondent eats needs help cutting, moving (sleeping-sitting), mobilization requires assistance to move from bed to a wheelchair, and needs help getting dressed, especially wearing pants.

Respondents are independent because the respondent can perform all daily activities without requiring the help of others, this can occur because the stroke experienced by the respondent is mild, meaning that brain damage caused by stroke does not attack all parts of the brain so that motor function does not suffer. paralysis, only experiencing decreased function, especially the hands that experience muscle weakness but are not paralyzed, so that respondents can still carry out daily activities without assistance such as defecating and urinating independently, taking care of themselves (washing face, combing, brushing teeth) , using the toilet (to/from the toilet, flushing, wiping, taking off/putting on pants), eating, moving (sleeping-sitting), mobilizing, dressing up and down stairs, and bathing, all daily activities can be done by the respondents themselves.

CONCLUSIONS

The level of dependence of stroke patients in doing ADL is more with mild dependence. The level of dependence adjusts to the severity of stroke experienced by each patient. It is necessary to evaluate ADL appropriately and effectively in stroke patients so that it can be used as a basis for decision making in treatment, rehabilitation, and nursing actions

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