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CLINICAL INDICATORS OF FEEDING SELF-CARE DEFICIT BASED ON BARTHEL INDEX MEASUREMENT IN PATIENTS SUFFERING FROM STROKE

Intansari Nurjannah[1*], Vini Febriyani Zulfa[2], Dwi Harjanto[1], Erna Fitriana[3], Ngatini[3]

[1]Mental Health and Community Department, Faculty of Medicine, Universitas Gadjah Mada, Indonesia
[2]School of Nursing, Faculty of Medicine, Universitas Gadjah Mada, Indonesia
[3]Sardjito Central Hospital, Yogyakarta, Indonesia

*Corresponding author:
Intansari Nurjannah, S.Kp., MN.Sc., Ph.D
Associate Professor, Psychiatric and Community Nursing Department, Faculty of Medicine, Universitas Gadjah Mada
Jl. Farmako, Senolowo, Sekip Utara, Kec. Depok, Kabupaten Sleman, Daerah Istimewa Yogyakarta 55281, Indonesia
E-mail: intansarin@ugm.ac.id

Abstract
Objective: This aim of this research is to describe clinical indicators of feeding self-care deficit based on Barthel Index measurement in patients with stroke.
Methods: The research used a quantitative description study with cross-sectional design. This research was conducted in one hospital in Yogyakarta, Indonesia on March – April 2017 with total sampling technique. Instrument was developed based on clinical indicators of NANDA-I nursing diagnosis of feeding self-care deficit.
Results: There were 28 respondents involved in this study, with males (60.7%) and females (39.3%) with an average age of 57 years. Respondents who suffered from non-hemorrhagic stroke were 60.7% and hemorrhagic stroke were 39.3%. Clinical indicator items for impaired ability to swallow sufficient amount of food (9.1%) was found in respondents with independency criteria on Barthel Index. Impaired ability to swallow sufficient amount of food item (25%) and impaired ability to prepare food (25%) were found in respondents with partial dependency criteria. The most items identified on respondents with severe dependency criteria were impaired ability to self-feed a complete meal item (53.8%) and impaired ability to prepare food item (53.8%).
Conclusion: There were different pattern of clinical indicators items found in different level of Barthel index level criteria.

Keywords: clinical indicators; nursing diagnosis; Barthel index; stroke

INTRODUCTION

Stroke is rising up in numbers every year proportionally with older age and certain risk factors. Based on Indonesia's data of basic health research, the prevalence of Indonesian that had been diagnosed as stroke by doctors were 57.9%. Stroke prevalence in Yogyakarta is striking in second place (10.3%) after North Celebes (10.8%) (Kementerian Kesehatan Kesehatan RI, 2013). The Indonesia's data of basic health research shows that prevalence of stroke was 7.1% in Yogyakarta (Kementerian Kesehatan Kesehatan RI, 2013). This proved that stroke cases in Yogyakarta is rising and needs significant attention from healthcare professionals. Between 1990 to 2013, there is a rising number of disabilities caused by ischemic stroke and death by ischemic and hemorrhagic stroke (Feigin et al., 2015; World Stroke Organization, 2016).

Stroke is caused by interruption of blood supply to the brain, mostly because of the

blood artery either broken or obstructed by mass on arterial wall causing nutrition and oxygen supply are disturbed (World Health Organization, 2014). Stroke shows symptoms such as face muscles paralysis, speaking articulation problem, change in consciousness status, and visual problem on eyes (Kementerian Kesehatan Kesehatan RI, 2013).

Based on prominent symptoms, it is well-noted that stroke patients definitely will have many difficulties in doing their daily activities, moving from one-point-to-another and even a simple self-caring for example in feeding themselves (Mark, 2016). Feeding difficulty by definition is a difficulty in fulfilling feeding function independently, including in preparing the food and/or beverages (Klinke, Wilson, Hafsteinsdóttir, & Jónsdóttir, 2013). Self-care is actions that brings patient to healthier lifestyle, able to maintain long-term condition, and to prevent from further incoming diseases (Woldemariam, 2013). Self-care deficit on stroke patients (walking, getting dressed, and eating) happens in daily basis with or without help from others. One parameter used for calculating the quality of independency of patients is Barthel's index.

Feeding function in stroke patients is based on nursing diagnosis of NANDA-1 as feeding self- care deficit. However, in NANDA-I taxonomy, nursing diagnosis has clinical indicator that is different from Barthel's index in feeding function item. It takes further research of nursing diagnosis to identify clinical indicator to achieve a more accurate nursing diagnosis based on patient's responses. Furthermore, it is still a few research about clinical indicator of nursing diagnosis of feeding function (Pascoal et al., 2014).

METHODS
Design
This was a descriptive-quantitative research with cross-sectional design.

Setting
This study was conducted in one hospital in Yogyakarta Indonesia from March to April 2017.

Participants
There were 28 samples recruited using total sampling technique in one hospital in Yogyakarta. The inclusion criteria of the sample were patients with stroke with Barthel's index score 1 in feeding function item. Exclusion criteria of the sample were unconscious, dysphagia, and patients who left hospital before they had permission to be discharged.

Measures
This study used instruments of Barthel's index and clinical indicator of nursing diagnosis of feeding self-care. These instruments were developed and arranged based on clinical indicators of nursing diagnosis NANDA-I taxonomy by researchers in checklist form and structured interview for data collecting technique. Total score of Barthel's index ranged from 0 to 20, consisting of independent, partial dependent, severe dependent, and total dependent level of criteria, with Guttman scale with score 1 for "yes" answer and 0 for "no" of stroke clinical indicators on patients. Clinical indicators instrument were checked by 3 experts for content of validity before data sampling was taken, and the result was valid (I-CVI = 1& S-CVI =1). Clinical indicators instrument using reliability test with formula KR20 and the result was 0.8751, which means this instrument was reliable with value >0.70 (Sabri, 2013).

Data Collection
Data were collected in two months by nurses who were working in this stroke unit hospital. Nurses firstly screen patients using inclusion and exclusion criteria and interview patients using research instrument.

Data Analysis
Data analysis in this research using univariate analysis to recognize respondent's characteristic, the category of stroke, respondents grouping into criteria in Barthel's indexing score, and the frequency distribution of clinical indicators of nursing diagnosis NANDA-I taxonomy feeding self-care deficit. Data processing was done by computer.

RESULTS

The majority of respondents were males with average age of 57.46 years old (SD±12,66). Most respondents were government employee with university background (see Table 1). More patients were suffering from non-hemorrhagic stroke than hemorrhagic stroke (see Table 2). The most dominant criteria of Barthel index was severe dependent followed by independent and partial dependent (see Table 3 and Table 4).

Table 1 Frequency distribution of respondents' characteristic in patients with stroke (n=28)

Characteristic	Mean ± SD	Frequency (f)	Percentage (%)
Age			
17 – 25 years old	57.46 ± 12.66	1	3.6
26 – 35 years old		0	0
36 – 45 years old		3	10.7
46 – 55 years old		6	21.4
56 – 65 years old		12	42.9
>65 years old		6	21.4
Sex			
Female		11	39.3
Male		17	60.7
Education			
College		8	28.6
High school		6	21.5
Junior High		4	14.3
Elementary School		6	21.4
No school		4	14.3
Occupational Status			
Employed		15	53.6
Unemployed		13	46.4
Civil status			
Single		1	3.6
Married		23	82.1
widowed		1	3.6
widow		3	10.7
Stroke Classification			
Hemorrhagic		11	39.3
Non-Hemorrhagic		17	60.7
Total		28	100

Table 2 The percentage of respondents with hemorrhagic and non-hemorrhagic stroke in every criterion of Barthel index in the stroke unit (n=28)

| Stroke classification | Criteria of Barthel index in stroke unit (%) | | | |
	Independent (n=11)	Partial dependent (n=4)	Severe Dependent (n=13)	Total (%)
Stroke Hemorrhagic	27.3	18.2	54.5	100
Stroke Non-Hemorrhagic	47.1	11.8	41.2	100

Table 3 Frequency distribution of patients with stroke in each category of Barthel index (n=28)

| Indexing criteria of Barthel index in stroke Unit | Score range of Barthel index | Gender Percentage (%) | | Number of respondents | Mean ± SD |
		M	F		
Independent	15 – 20	81.8	18.2	11	18.36 ± 1.57
Partial dependent	11 – 14	50	50	4	13± 1.16
Severe dependent	1 – 10	46.2	53.8	13	7.15 ± 2.04
Total dependent	0	0	0	0	0
Total		100	100	28	38.51 ± 4.77

Table 4 Average of total score in each criterion of Barthel index in stroke classification of patients with stroke in stroke unit in 2017 (n=28)

Stroke classification	Barthel index criteria (Mean ± SD)		
	Independent (n=11)	Partial dependent (n=4)	Severe dependent (n=13)
Hemorrhagic	18.67 ± 1.15	13 ± 1.41	7.33 ± 2.65
Non-hemorrhagic	18.63 ± 1.51	13 ± 1.41	7 ± 0.58

Table 5 Frequency distribution of clinical indicators of nursing diagnosis of feeding self-care deficit in Barthel index criteria in patients with stroke

No.	Items of clinical indicators	Barthel index criteria					
		Independent (n=11)	(%)	Partial dependent (n=4)	(%)	Severe dependent (n=13)	(%)
1	Inability of eating in acceptable way	0	0	0	0	1	7.7
2	Inability of eating in enough amount of food	1	9.1	1	25	2	15.4
3	Inability to manipulate food in the mouth	0	0	0	0	3	23.1
4	Inability to open food case	0	0	0	0	4	30.8
5	Inability to handle eating tools	0	0	0	0	4	30.8
6	Inability to swallow food	0	0	0	0	0	0
7	Inability to place food in/on food tools	0	0	0	0	5	38.5
8	Inability to hold the cup	0	0	0	0	5	38.5
9	Inability to take the food and put into mouth	0	0	0	0	4	30.8
10	Inability in using assist tools	0	0	0	0	4	30.8
11	Inability to finish meal portion	0	0	0	0	7	53.8
12	Inability to chew the food	0	0	0	0	0	0
13	Inability to prepare food to eat	0	0	1	25	7	53.8

DISCUSSION

The number of respondents in this research was 28 patients. Most respondents aged between 56 to 65 years, male, and married. Data from basic health research (Kementerian Kesehatan Kesehatan RI, 2013) stated that citizen diagnosed with stroke are increasing accordingly with age (Kementerian Kesehatan Kesehatan RI, 2013). Data from Riskesdas also stated that male and female have the same prevalence. Married males have bigger case incidence of stroke compare with females due to gender social experiences such as marriage history and social economy (Rachmawati, Utomo, & Nauli, 2013). Based on previous research, the highest number of stroke patients has college degree and working employee. Research also shows that stroke are more common in society with lower education and unemployed (Rachmawati et al., 2013).

Stroke classification data shows that respondents suffering from non-hemorrhagic stroke events were 17 patients (60.7%), and from hemorrhagic stroke were 11 patients (39.3%). The research of Rachmawati, et al shows that most respondents suffered from non-hemorrhagic stroke, 28 patients (56%), and hemorrhagic stroke was 22 patients (44%) (Rachmawati et al., 2013). Patients who suffered from non-hemorrhagic stroke are 171 patients and followed by hemorrhagic stroke of 70 patients. Non-hemorrhagic stroke is more common due to lifestyle that harmful to health in the community such as high-cholesterol consumption, smoking and alcohol-drinking habit in long term that will cause plaque obstruction in blood vessels that obstruct blood supply (Rachmawati et al., 2013). One survey shows that high temperature can be a risk factor for ischemic or non-hemorrhagic stroke (Wang et al., 2016). Lower temperature will cause

vasoconstriction, blood pressure and thrombocyte aggregation increasing, and activation of sympathy neural system that cause the increasing risk of stroke (Chen et al., 2017).

The result of this study shows that criteria of severe dependent dominantly were on patients with hemorrhagic stroke, and independent on patients with non-hemorrhagic stroke. No respondent was in total dependent since researchers put it in the exclusion criteria. Previous research has respondents of 50 patients and divided Barthel's index into 5 criteria and using a modified Barthel's index with score between 0 to 100 (Chen et al., 2017). The identified criteria include total dependent of 39 patients (78%), medium dependent of 8 patients (16%), and mild dependent of 3 patients. No patient was categorized as independent (Rakhman, 2014). Dhiman et al (2014) research on 130 respondents also divided total score of Barthel's index criteria into 4, namely total dependent (0-4) with 49 respondents, severe dependent (5-9) with 30 respondents, medium dependent (10-14) with 34 respondents, and mild dependent (15-19) with 17 respondents (Dhiman et al., 2014). This research also shows higher number on respondents with criteria partial dependent. Nevertheless, the higher of Barthel score, the lesser are the respondents (Maselko, Bates, Avendano, & Glymour, 2009). Observation on Morone et al (2015) research shows that patients with hemorrhagic stroke have better outcome of functional status based on total score of Barthel's index compared with non-hemorrhagic stroke patients. This is different with the result of this research which non-hemorrhagic stroke patients have higher percentage in independent criteria than hemorrhagic stroke patients (Dhiman et al., 2014). The research of Xiong et al (2012) shows that patients with acute ischemic stroke or non-hemorrhagic were due to bad functional status.

Stroke respondents with independent criteria show clinical indicators that the same as respondents with partial dependent criteria in Barthel's index. All clinical indicators item appeared on stroke patients with dependent criteria in Barthel's index, except 2 items of clinical indicators, namely inability to chew the food and inability to swallow the food. Condition of a few patients with these criteria are still weak including the extremities that supposed to be helped these patients to eat their food.

One of the causes of this feeding inability is hemiparesis (Xiong et al., 2012). Hemiparesis is common in patients with stroke. Hemiparesis is a neurological deficit that causes weakness on one side of the body and this condition makes the patient unable to maintain balance in activities (Dhiman et al., 2014). This imbalance will affect patients in sitting, moving from one place to another, joints articulation, and standing straightly (Dhiman et al., 2014). Sitting position is not a functional but it is an essential component that is believed to be able to support another functional activities, such as getting dressed, moving, and eating on sitting position (Morone et al., 2015). Dhiman et al (2014) research shows that there are no differences between lesion of right hemiparesis or left one. Each lesion affects patient's dependency and fulfilling daily activities including eating (Dhiman et al., 2014).

Stroke will lead patients into disability, and disability can be changed if patients change their lifestyle. Disabilities in stroke patients are marked with paralysis on extremities including hemiparesis, blood pressure increasing, and aging. Disabilities will make patients dependent in fulfilling daily activities including feeding activity (Xiong et al., 2012). Furthermore, stroke patients will increasingly show progress on functional status in feeding, get dressed, go to toilet, and do make-up if given continuous rehabilitation therapy earlier since treated in hospital (Oyewole, Ogunlana, Oritogun, & Gbiri, 2016).

CONCLUSION
There are different patterns of clinical indicators based on Barthel index measurement.

Author Contribution

All authors contributed equally in this study.

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