The Gadjah Mada Stroke Algorithm Scoring System (ASGM) and Guy's Hospital Stroke Score (GHSS) in Determining the Type of Stroke Emergency as A Substitute for the CT-Scan in the Emergency Room

M. Sobirin Mohtar[1], Cynthia Eka F Tjomiadi[2], Ahmad Apriannor[3]

[1,2]Department of Nursing, Faculty of Health, Sari Mulia University, Banjarmasin, Indonesia
[3]RSUD Dr. H. Moch. Ansari Saleh Banjarmasin, Indonesia
Corresponding author; *sobirinmuchtar12345@gmail.com*

ABSTRACT

Background: Nurses need a diagnostic tool in the form of a simple scoring system including the Gadjah Mada Stroke Algorithm (ASGM) and Guy's Hospital Stroke Score (GHSS) in determining the type of stroke and preventing delays.
Purpose: Analyzing the comparison of the ASGM and GHSS scoring systems in determining the type of stroke emergency.
Methods: This research method was a quantitative pre-experimental design (posttest only design). The population was all stroke patients in the emergency room with 30 samples and the sampling technique is accidental sampling. As for the stages for each respondent, an ASGM assessment was carried out which consisted of 3 components and GHSS 9 components. The statistical test used is the Paired Sample T-test.
Results: Based on the results of the Paired Sample T-test was the value of Sig. of 0.000 <0.05. The average difference in the duration of determining the type of emergency and nursing diagnoses on the assessment system and ASGM and GHSS is 7.6 minutes. Furthermore, it also shows lower data of 7.066 and upper 8.134. This shows that the duration range for determining the type of emergency using ASGM is around 7.1 – 8.1 minutes faster compared to GHSS. Based on the accuracy test that ASGM has a sensitivity level of 86.66% and a specificity of 96.66%, while GHSS has a sensitivity level of 56.66% and a specificity of 63.33%.
Conclusion: ASGM and GHSS assessment methods are effective in determining the type of emergency in stroke patients in the emergency department.

Keywords: Strokes; ASGM; GHSS; Determination of the Type of Emergency.

BACKGROUNDS

Stroke is a brain disorder focal or global with clinical symptoms that last rapidly for 24 hours or more and can cause death without any cause other than vascular disorders. Someone can have a stroke every 40 seconds and can kill every 3 minutes 45 seconds (Mohtar, 2019). Stroke is the 3rd most common cause of death after heart disease and cancer (Sacco et al, 2013). There are two types of stroke, namely ischemic stroke (SI) and hemorrhagic stroke (SH), where 80% of all strokes are SI and the remaining 20% are SH (Fakhruddin & Nurmalia, 2019).

Data *World Health Organization* shows that every year there are 13.7 million new cases of stroke and around 5.5 million deaths occur due to stroke (Na'im et al, 2019). The prevalence of stroke in Indonesia continues to increase every year. The 2018 Riskesdas data of 10.9% proves that this data has increased compared to 2013 which was only 7%. Based on a doctor's diagnosis, among the population of provinces in Indonesia, South Kalimantan Province has the 3rd highest incidence rate in 2018, which is 12.7% per mil (Ministry of Health, 2019).
One of the important keys inTo reduce stroke mortality and morbidity is to provide prompt and appropriate treatment. If treatment is given for more than the golden hour, the neurological damage will be permanent (Mohtar, 2019). The most recommended time for stroke patients is 3-4.5 hours (Fassbender et al, 2013).

Proper stroke management is carried out based on type. The standard in the diagnosis of stroke is a CT (Computerized Tomography) scan of the head which can detect strokes that occur <3 hours. To find out the results of the diagnosis, the patient must wait for the doctor to read the CT-scan results which takes 3-7 days which will certainly have an impact on delays in treatment and the severity of the disease. CT scan is an important tool for definitively differentiating the type of stroke, knowing the location of the lesion and determining the extent or severity of the disease. However, this tool is expensive and not all areas have it. Nurses as health practitioners need a clinical diagnostic tool in the form of a simple scoring system (Fakhruddin & Nurmalia, 2019).

There are several systems scoring (assessment) that can be used to distinguish between types of stroke, but there are many assessment models that have their own characteristics so that nurses are still unsure which one is more effective, including the Gadjah Mada Stroke Algorithm (ASGM) and Guy's Hospital Stroke Score (GHSS) which are a a neurological deficit assessment tool that is designed as a tool that is easy, valid and reliable in determining the type of stroke emergency (Mohtar et al, 2022).

Based on a field survey on March 29 2023 at Dr. Moch Ansari Saleh Banjarmasin obtained data from the last 8 months of patient visits to the emergency room with SH of 111 and SI of 316. The results of a simple interview with 2 families of stroke patients showed that when they arrived at the emergency room >5 hours from the attack, they were still queuing for a CT scan. At that time, simple interviews were also conducted with 3 ER nursesso far I have never used the ASGM or GHSS scoring system, but always used a CT-Scan which requires quite a lot of time and costs. So that patients sometimes refuse because they are constrained by costs and are afraid of the procedure.

Based on this, it encourages researchers to researchThe Effectiveness of the ASGM and GHSS Assessment Systems in Determining the Type of Stroke Emergency in the Emergency Room of RSUD Dr. Moch Ansari Saleh Banjarmasin

PURPOSE
Analyzing the effectiveness of the ASGM and GHSS scoring systems in determining the type of stroke emergency in the Emergency Room

METHODS
This research method is a quantitative pre-experimental design (posttest only design). The population is all stroke patients in the emergency room with 30 samples and the sampling technique is accidental sampling. Data collection for each sample was directly carried out using two assessment methods. The ASGM assessment instrument consists of 3 components and GHSS 9 components. Data analysis used the Paired Sample T-test. continued the accuracy test to see the level of sensitivity and specificity of each scoring system.

RESULTS
The characteristics of the respondents, it was found that the average sex was mostly male (53.33%). The average age of most respondents is 55 years (46.7%), this is consistent with the risk factors for stroke patients occurring at the age of more than 45 years. The highest average medical diagnosis was Non-Hemorrhagic Stroke characterized by Non-Hemorrhagic Stroke and also accompanied by Covid-19 Pneumonia (23.33%).

Table 1. Characteristics of Respondents (n=30)

Characteristics of Respondents	n	%
Gender		
Man	16	53,3
Woman	14	46,7
Age		
18 – 25 years	0	0
26 – 35 years	1	3,3
36 – 45 years	3	10
46 – 55 years	12	40
>55 years	14	46,7
Family Education Level		
No school	0	0
SR (People's School)	0	0
Elementary School	5	16,7
Junior High School	5	16,7
Senior High School	14	46,6
D3	3	10
S1	3	10
S2	0	0
S3	0	0
Reason for being taken to hospital		
Must be treated immediately	7	23,3

Characteristics of Respondents	n	%
Family recommendation or others	3	10
Worsening condition	20	66,7
Pause Time Signs Symptoms with Decision Making		
<1 minute	2	6,7
5 – 10 minutes	14	46,7
20 – 30 minutes	6	20
40 – 60 minutes	4	13,3
>60 minutes	4	13,3
Pause for decision making until arriving at the emergency room		
<1 minute	0	0
5 – 10 minutes	14	46,7
20 – 30 minutes	8	26,7
40 – 60 minutes	4	13,3
>60 minutes	4	13,3
Awareness Status When coming to the ER		
Composmentist	18	60
Loss of consciousness	12	40
Patient medical diagnosis		
Decreased Consciousness e c. SNH dd SH	6	20
SNH susp. Pneumo Cov19	7	23,3
SNH dd SH	7	23,3
SNH dd SH with HT emergency	1	3,3
SNH+Edema anasarka ec Riw. Strokes + CHF	1	3,3
Susp. CVA dd Hemiparese	1	3,3
Hemiparese susp. SNH dd SH	1	3,3
Stroke secondary attack	1	3,3
SAH ec SNH dd SH	1	3,3
SH ec ICH	3	10
SH with TB on Treatment	1	3,3

Table 1 illustrates that according to shows that patients with comorbidities (strokes) are at risk of being confirmed with Covid-19. The reason for the family to bring in patients with the highest average rate was worsening of the condition (66.7%) because what might support the cause was the family's low high school education level (46.6%), which affected the decision making to obtain medical assistance for the family. The majority of 40% of patients who come experience a decrease in consciousness. This suggests that some patients are already experiencing neurological deficits.

There were some patients who experienced a delay in referral of 10 minutes (20%) since the signs of stroke appeared, they did not immediately make a decision that should have been done 20 minutes before they had received a Door to CT (CT Scan) and there were also some patients who were 10 minutes late (26.7%). gave a decision to the emergency room, which should have received Door to Needle (therapeutic) 20 minutes earlier.

Table 2. Distribution of Study Results of Stroke Patients in the Emergency Room (n=30)

Variable		n ASGM	%	n GHSS	%
Emergency Type Determination Score					
ASGM	GHSS				
Babinski reflex (+) (SNH)	<4 (SNH)	16	53,3	8	26,7
Consciousness / Headache (+) (SH)	>24 (SH)	14	46,7	22	73,3
Length of Duration of Determining the Type of Emergency (Assessment)					
10 – 20 minutes (fast)		26	86.7	17	56,7
>20 minutes (slow)		4	13,3	13	43,3
Means		15.73 minutes		21.30 minutes	
Established diagnosis					
Decreased intracranial adaptive capacity related to cerebral edema		28	93,3	28	93,3
Ineffective breathing pattern related to neuromuscular disorders		0	0	1	3,3
Impaired physical mobility related to neuromuscular disorders		2	6,7	28	93,3
Impaired verbal communication related to brain damage		0	0	26	86.7
Swallowing disorders related to cranial nerve disorders		0	0	24	80
Acute pain related to physiological (ischemic) injurious agent		14	46,7	0	0
Nausea b / d increased intracranial pressure		4	13,3	0	0
Impaired spontaneous circulation related to intracranial hemorrhage & decreased ventricular function		0	0	2	6,7
Hypovolemia related to increased intracranial pressure		8	26,7	0	0
Nutritional deficiencies bd neurological deficits		1	3,3	1	3,3
Number of Diagnoses set					
0 – 2 Actual diagnosis		24	80	4	13,3
3 – 5 Actual diagnosis		6	20	26	86.7
6 – 10 Actual diagnosis		0	0	0	0
11 – 17 Actual diagnosis		0	0	0	0
Length of duration of diagnosis					
15 – 40 minutes (fast)		29	96.7	19	63,3
>40 minutes (slow)		1	3,3	11	36,7
Means		29.27 minutes		36.87 minutes	

Table 2 illustrates that the neurological deficits that occur in patients when measured using ASGM with the highest score of 53.33% in the Non-Hemorrhagic Stroke category,

while when measured using GHSS with the highest score of 73.3% in the Hemorrhagic Stroke category. This shows that the patient comes to the emergency room already in a state of damage to his neurological function. The duration of determining the type of emergency (assessment) using ASGM requires <20 minutes (15.73 minutes), whereas with GHSS >20 minutes (21.30 minutes). This shows rationally that the shorter the points studied (ASGM) the faster the assessment time required, and vice versa the longer and more detailed the points studied (GHSS) the longer the assessment time required.

The nursing diagnoses generated from each study were almost the same and the names varied, the ASGM and GHSS studies both produced the most common diagnoses, namelyDecreased adaptive intracranial capacity related to cerebral edema (93.3%).This shows that the average patient with a positive stroke will experience signs of increased intracranial pressure so that the diagnosis is certain and often enforced. The highest number of diagnoses resulting from the highest ASGM assessment were 2 diagnoses (80%), while those resulting from the highest GHSS assessment were 5 diagnoses (86.7%). The duration of diagnosis using ASGM is not <30 minutes (29.27 minutes), while using GHSS it takes >30 minutes (36.87 minutes). This shows rationally that ASGM, the faster the assessment, the fewer diagnoses that are enforced, as well as the GHSS, the longer and more detailed the study, the more varied the diagnoses. This study used the Paired Sample T-test to compare the averages and seek effectiveness between the duration of determining the type of emergency (assessment) and the duration of determining nursing diagnoses using ASGM and GHSS. Paired Sample T-test has the condition that the data must be normally distributed. So, before the T test is carried out, the data normality test is first carried out with the following results:

Table 3. Normality test

	Group	Kolmogorov-Smirnova			Shapiro-Wilk		
		Statistics	Df	Sig.	Statistics	Df	Sig.
Duration	ASGM	.074	30	.200*	.962	30	.346
	GHSS	.119	30	.200*	.959	30	.297

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Source: Primary Data, 2023

Based on the results of the normality test with Shapiro-Wilk in table 4.7 it is known that the results of the significance value for the ASGM variable are $0.346 > 0.05$ and for the GHSS variable are $0.297 > 0.05$, which means that the data is normally distributed. So, this study met the requirements for the T test. The results of the T test can be seen in table 4.8 below:

Table 4. Paired Sample T-test

	Means	std. Deviation	std. Error Means	Lower	Upper	Q	df	Sig. (2-tailed)
3S2D - 3S	7,600	1,429	.261	7,066	8.134	29,135	29	.000

Source: Primary Data, 2023

The average difference in the duration of determining the type of emergency and nursing diagnoses on the assessment system and ASGM and GHSS is 7.6 minutes. Furthermore, it also shows lower data of 7.066 and upper 8.134. This means that the difference between the duration of GHSS and ASGM is 7.1 to 8.1 minutes. This shows that the duration range for determining the type of emergency using ASGM is around 7.1 – 8.1 minutes faster compared to GHSS. Based on the Paired Samples T-test it is known that the t count is 29.135 > t table 2.045 and the Sig. of 0.000 < 0.05. Thus, H0 is rejected and Ha is accepted, which means that there is a significant difference between the ASGM and GHSS scoring systems in determining the type of emergency in stroke patients. Based on the accuracy test, it was seen from the sensitivity and specificity levels of each scoring system, that ASGM had a sensitivity level of 86.66% and a specificity of 96.66%, while GHSS had a sensitivity level of 56.66% and a specificity of 63.33%.

DISCUSSION
A. ASGM & GHSS Rating System
The results of the initial analysis (table 5.2) found that neurological deficits that occurred in patients when measured using ASGM obtained the highest score with a score of 16 (53.33%) in the Non-Hemorrhagic Stroke category, while when measured using GHSS the highest score was obtained with a score of 22 (73.3%) in the Hemorrhagic Stroke category. The results of the analysis also obtained the lowest ASGM score with a score of 14 (46.7%) in the Hemorrhagic Stroke category and GHSS with a score of 8 (26.7%) in the SNH category which indicates the condition of the patient experiencing a severe stroke with decreased consciousness.

ASGM was developed in Indonesia to differentiate intracerebral hemorrhagic stroke from acute ischemic stroke. The variables taken to develop this algorithm consist of decreased consciousness, headaches, and Babinski reflexes. This algorithm is made to overcome the weakness of scoring which requires calculation and takes a relatively longer time (Saudin, 2020). GHSS is an adaptation of data from the Oxfordshire community stroke project (OCSP) which was first implemented at the National Hospital in London with a high level of accuracy and simpler variables so that it is easy to use in determining the type of stroke (Saudin, 2020). GHSS can examine clinical signs associated with stroke symptoms, namely level of consciousness, vomiting, headaches, diastolic blood pressure, and atheroma markers (Adam, 2007). GHSS is easy to use and can be performed by medical personnel in emergency areas (Mochtar, 2019).

According to Sam et al., 2018 states that the Allen Stroke Score consists of eight parameters, where each parameter has a different weight value with a promising level of accuracy. Haemorrhagic stroke if the score is > 24, Non hemorrhagic (ischemic) stroke if

the score is < 4, Scores between 4 to 24 indicate doubt so a head CT scan is recommended to establish the diagnosis. So this shows that CT-Scan is a gold standard with high reliability and validity that can be used for a specific and more accurate diagnosis of stroke.

B. Duration of Emergency Type Determination with ASGM and GHSS
The time factor or the duration of the documentation needed by nurses has a significant influence (Soeprijadi, 2006). According to Nursalam (2008) the essence of nursing care documentation is the creation of nursing activities that guarantee the growth of views, attitudes, ways of thinking, and acting professionally for every nurse. A systematic and logical approach with a correct scientific basis, as well as through documentation of the nursing process, all activities in the nursing process can be displayed again so that they can be re-examined for development or improvement (Nursalam, 2008).

The results of the initial analysis (table 2) found that the duration of determining the type of emergency (assessment) when using ASGM requires <20 minutes (fast) with an average speed (15.73 minutes), whereas with GHSS >20 minutes (slow) with an average speed (21.30 minutes) .Classification of the speed of stroke assessment according to the ASA guidelines (2018), namely, it is said to be fast if the assessment process takes 10-20 minutes and is said to be slow if the speed of stroke assessment takes > 20 minutes. The classification of the speed of diagnosis is according to the ASA guidelines (2018), that is, it is said to be fast if the determination of a nursing diagnosis takes 15-40 minutes and is said to be slow if the determination of a nursing diagnosis takes >40 minutes.

ASGM among them has advantages namely nurse doing the initial assessment using this rating system do not takes a long time because the nurse only does the assessment and then evaluates it with an interpretation that is very easy to memorize so it does not require special training to use this ASGM measurement tool (McGee, 2012; Adams, Zoppo, & Kummer, 2007; Nyodu, et al, 2013). Meanwhile, with a CT scan, patients must get this tool and need time and transportation if the location is a hospital away from the facility (Kolapo, et al 2013; Pavan, et al, 2009).

Kogan (2020) in his journal stated that the total GHSS score in stroke patients is an assessment of the severity of the stroke experienced by the patient. GHSS is widely used because it has several advantages or advantages, including being able to be used to assess neurological deficits periodically in acute stroke conditions, while the disadvantages or limitations of this instrument are that it tends to pay more attention to the assessment of the history of the disease, while other components are given less attention, for example, to nerve damage in head (cranial).

C. Actual Nursing Diagnosis of Stroke Patients
The NANDA, NOC and NIC nursing diagnoses are acceptable standard of nursing language used for nursing care. *The North American Nursing Diagnosis Association* (NANDA), is a existing nursing associations North American countries are created the first classification of nursing diagnoses in 1973. The nursing diagnosis is basic to determine nursing interventions to achieve that outcome expected and can be accounted for by nurses.

Initial analysis results (table 2) the actual nursing diagnoses in stroke patients resulting from each study were almost the same and the names varied, the ASGM and GHSS studies both produced the most common diagnoses namely decreased intracranial adaptive capacity b/d cerebral edema (93.3%).

In accordance with the reference that decreased intracranial adaptive capacity. Its a condition where individuals experience or are at risk of experiencing a decrease in nutrition and respiration in cerebral tissue due to a decrease in blood supply in cerebral tissue (Carpenito, 2007). Changes in tissue perfusion is a decrease in oxygen resulting in failure to maintain tissue at the capillary level (Rosenberg and Smith, 2005). The characteristic limitations of this diagnosis are decreased or absent arterial pulse, changes in skin color, pallor, cyanosis, changes in cooler skin temperature, decreased changes in blood pressure, capillary filling in less than three seconds (Carpenito, 2007). This diagnosis is prioritized by the author in second place, whereas according to Maslow's Hierarchy it is in first place, because cerebral perfusion is related to oxygenation of brain tissue. Oxygen is a very primary need and absolutely must be met to maintain biological homeostasis and survival for humans. If this diagnosis is not treated immediately, there is a risk of experiencing a decrease in verbal, motor and sensory responses, and changes in vital signs (Hidayat, 2004).

Furthermore, the actual nursing diagnoses in stroke patients resulting from each of the most frequent assessments were GHSS resulting in the highest number of diagnoses. Impaired physical mobility related to neuromuscular disorders (93.3%). In accordance with the reference that interference mobility physique is limitations in physical movement particular body part at an extremity (Rosenberg and Smith, 2005). Impaired physical mobility is a condition when an individual experiences or at risk of experiencing limited physical movement (Carpenito, 2007). The etiology that the authors include in The diagnosis is physical weakness, should be diagnosed it is associated with impaired physical mobility with decreased muscle strength (Muttaqin, 2008). Data that supports the problem This is obtained from the results of the strength assessment muscles, upper left extremity 2, upper right 4, left lower extremity 2, right lower extremity 5. The diagnosis can be made if found supporting data viz decreased ability to move purposefully in the environment (eg. mobility in bed, moving/ambulation), limited range of motion (Carpenito, 2007). This diagnosis is prioritized by the authors as second order, whereas according to Maslow's Hierarchy in first order, namely physiological needs which include the need for activity and mobilization. If this diagnosis is not treated immediately, there will be a risk of contractures and decubitus (Hidayat, 2004).

The actual nursing diagnoses in stroke patients resulting from each GHSS assessment resulted in the name of the diagnosis being the most common. Impaired verbal communication related to brain damage (86.7%). The data is in accordance with theory according to (Amin, 2015), symptoms that arise due to stroke, namely experiencing weakness and paralysis, sudden loss of sensitivity, slurred and slurred speech, impaired vision, mouth slanted or asymmetrical when grinning, impaired memory, severe headaches, vertigo, decreased consciousness and impaired brain function.

D. Number of Actual Nursing Diagnoses of Stroke Patients

Initial analysis results (tables 2 and 3) The highest number of diagnoses resulting from the highest GHSS assessment were 2 diagnoses (80%), while those resulting from the highest GHSS assessment were 5 diagnoses (86.7%). The number of actual nursing diagnoses in stroke patients is closely related to the results of the assessment using the ASGM and GHSS methods. The higher the GHSS value, the more actual diagnoses obtained, but the more points studied, the more diagnoses obtained, in this case, GHSS is more than ASGM. This shows that although rationally there should be a complete assessment, the resulting diagnoses are certainly many, but they are unrelated and ineffective on the grounds that, even though there are many diagnoses, the expectations in the speed range of the duration of the determination can exceed a simple assessment, namely ASGM.

According to Black and Hawks (2005); Smeltzer and Bare (2008); which states that in the conditions of precoma and coma, the components of assessment are disturbed, among others; degree of consciousness, horizontal conjugate eye movements, visual field, facial paresis, motoric arms and legs, limb ataxia, sensory, language, dysarthria and unilateral neglect. All ASGM and GHSS component assessments are fully filled with maximum scores so that the actual nursing diagnoses obtained are at most 5 diagnoses. Meanwhile, in composmentis conditions, all ASGM and GHSS component assessments are fully filled but the scores are not optimal so that the scores obtained are 1-2 diagnoses. According to Hickey (2003) nursing problems that will arise in stroke patients with decreased consciousness are; disturbance of breathing patterns, changes in perception or sensory (vision)

E. Duration of Actual Nursing Diagnosis Determination of Stroke Patients

The nursing diagnosis process consists of analysis, interpretation of data, identification of client problems, and formulation of nursing diagnoses. Collaborate with clients, close to clients, other health workers to validate nursing diagnoses. Review and revise diagnoses based on new data. The nursing diagnosis is validated by the client whenever possible and the nursing diagnosis made is accepted by colleagues as a relevant and significant diagnosis. The diagnosis is documented to facilitate implementation planning, evaluation, and research.

Initial analysis results (table 2 & 3), the duration of determining the type of emergency (assessment) using ASGM requires <20 minutes (15.73 minutes), whereas with GHSS >20 minutes (21.30 minutes). The speed of time for establishing a nursing diagnosis ideally does not exceed the golden time for assistance when it arrives at the ER. In accordance with the 2018 ASA (American Stroke Association) golden period (golden time of assistance) for stroke patients 3 – 4.5 hours. Ideally, pre-hospital to intra-hospital (ER) in the first 20 minutes you will get a Door to CT (CT-Scan) and the first 60 minutes after an attack you will get a Door to Needle (therapeutic). This means 20 minutes in the emergency room immediately for assessment & CT scan and 40 minutes or so on for the time to determine the diagnosis and provide intervention, be it surgery or treatment in the treatment room (ICU or inpatient).

Valid nursing diagnoses can help solve the problem the patient, but the process of identifying very appropriate nursing diagnosis difficult to do because of the human response complex and unique. Diagnosis Valid nursing is very important to reduce the risk of errors diagnose. Besides that, a lot Nursing diagnoses are also wrong one factor that makes it difficult for nurses determine nursing diagnoses. Nursing diagnoses include: bio-psycho-sociospiritual Also seldom fulfilled due to the time process used long enough

E. Testing the Effectiveness of the Gadjah Mada Stroke Algorithm (ASGM) and Guy's Hospital Stroke Score (GHSS) Algorithm Scoring System in Determining the Type of Emergency Stroke in the Emergency Room of RSUD Dr. Moch Ansari Saleh Banjarmasin

Based on the results of the Paired Sample T-test in table 4, it is known that the average difference in the duration of determining the type of emergency and nursing diagnoses in the assessment system and ASGM and GHSS is 7.6 minutes. Furthermore, it also shows lower data of 7.066 and upper 8.134. This means that the difference between the duration of GHSS and ASGM is 7.1 to 8.1 minutes. This shows that the duration range for determining the type of emergency using ASGM is around 7.1 – 8.1 minutes faster compared to GHSS.

Classification of the speed of stroke assessment according to the ASA guidelines (2018), namely, it is said to be fast if the assessment process takes 10-20 minutes and is said to be slow if the speed of stroke assessment takes > 20 minutes. The classification of the speed of diagnosis is according to the ASA guidelines (2018), that is, it is said to be fast if the determination of a nursing diagnosis takes 15-40 minutes and is said to be slow if the determination of a nursing diagnosis takes >40 minutes. So that it can be concluded that the duration of ASGM assessment is more effective because apart from being simple and simple, the assessment also focuses on the center of neurological deficits (brain that is experiencing ischemic and hemorrhagic).

This is reinforced by the fact that the speed at which nursing diagnoses are determined ideally does not exceed the golden time for assistance when arriving at the ER. In accordance with the 2018 ASA (American Stroke Association) golden period (golden time of assistance) for stroke patients 3 – 4.5 hours. Ideally, pre-hospital to intra-hospital (ER) in the first 20 minutes you will get a Door to CT (CT-Scan) and the first 60 minutes after an attack you will get a Door to Needle (therapeutic). This means 20 minutes in the emergency room immediately for assessment & CT scan and 40 minutes or so on for the time to determine the diagnosis and provide intervention, be it surgery or treatment in the treatment room (ICU or inpatient).

Based on the Paired Samples t-test it is known that the t count is 29.135 > t table 2.045 and the Sig. of 0.000 <0.05. Thus, H0 is rejected and Ha is accepted, which means that there is a significant difference between the ASGM and GHSS scoring systems in determining the type of emergency in stroke patients.

This study is in accordance with Ramadhani's research on inpatients diagnosed with stroke at Haji Sukolilo General Hospital, Jombang Regency General Hospital and Dr.

Soetomo Surabaya in 2009 assessed the Gadjah Mada Stroke algorithm with a score of 83.33% sensitivity, 89.47% specificity and 80.72% accuracy. 12 Another study at Adam Malik General Hospital Medan conducted a diagnostic test of the Gadjah Mada Stroke algorithm on 60 stroke patients. The sensitivity, specificity, positive predictive value and negative predictive value were 96%, 90%, 96%, 95% for hemorrhagic stroke, while for ischemic stroke respectively 90%, 96%, 95%, 56% with an accuracy value of 68%

ASGM Rating Systemto overcome the weaknesses of scoring instruments that require calculations and require a relatively longer time. Fakhrudin's research (2019) found that ASGM has a higher accuracy and specificity value than the Siriraj Stroke Score (SSS). ASGM in this journal has a sensitivity value of 89%, specificity of 86%, accuracy of 88%, positive predictive value of 94% and negative predictive value of 75% (Mochtar, 2021).

The GHSS scoring system is a simple and concise assessment method in determining the type of stroke (Mochtar, 2021). Apart from that it has an accuracy rate of 70%, this shows that the accuracy of this method is good. This is in accordance with Meilyana's research (2020) that accuracy is said to be good if it has reached 80%. Based on the GHSS sensitivity and specificity test were 0.70 (95% CI 0.53-0.83) and 0.79 (95% CI 0.68-0.87) for SI stroke type and 0.54 (95% CI 0. 42-0.66) and 0.89 (95% CI 0.83 -0.94) for SH, this illustrates that this scoring system is quite accurate in terms of sensitivity and specificity (Nyodu, 2013).

This is in line with research (Sam et al., 2018) using the Allen Stoke Score not as a substitute for CT-Scans as an alternative in making stroke diagnoses in health services that still have limited tools. By using this diagnostic test, it is expected that mortality, physical and mental disabilities due to stroke in Indonesia can be reduced. In research (Sam et al., 2018) the use of the Allen Stroke Score has weaknesses, namely too many clinical signs and symptoms are used, to calculate the score manually is not easy and requires relatively long time, and one more thing, it has accuracy. low after being validated by several researchers.

In this study the level of accuracy in terms of sensitivity and specificity of each scoring system, that ASGM sensitivity level was 86.66% and specificity was 96.66%, while GHSS had a sensitivity level of 56.66% and specificity 63.33%. This is not in accordance with the Sembiring Study where the accuracy of GHSS is greater than ASGM with a ratio of 90%: 68%. (Saudi, 2020). Pavan et al (2012) said the accuracy of the ASGM examination was 85%,10 while Ramadhani stated that the accuracy of the GHSS was 80.72%. This difference is thought to be due to ASGM having more specific assessment variables on the brain, so that it is more accurate in detecting suspected types of stroke in the acute phase compared to GHSS.

Based on the analysis of all variables, in terms of the duration of the assessment and determining the number of nursing diagnoses, it is more effective to use ASGM, because it is simpler and simpler than GHSS so that the duration of the assessment is faster. Meanwhile the number of nursing diagnoses resulting from ASGM is more effective because focusing on neurological problems and the time needed according to the ASA guidelines. However, if determining the depth of actual nursing diagnoses, GHSS is more

effective because even though the point of assessment is long, in terms of the duration of the diagnosis, it is able to match the speed of the ASGM time span. It can be concluded that assessment method Elephant Stroke Algorithm Mada (ASGM) and Guy's Hospital Stroke Score (GHSS)effective in establishing the diagnosisactual nursing both in terms of the number of diagnoses and the duration of determination in stroke patients in the ED room.

CONCLUSION

The ASGM and GHHSS assessment methods are effective in establishing the diagnosis actual nursing in stroke patients in the Room Emergency Department, but in terms of the duration of assessment and determination of the number of diagnoses ASGM is more effective while the duration of determining nursing diagnoses is more effective GHHSS

ACKNOWLEDGMENTS

REFERENCES

AANN. (2004). Guide to the care of the patient with ischemic stroke. USA: PDL BioPharma.

Adams, HP, Zoppo, GJ, & Kummer, R. (2007). Management of stroke: A practical guide for the prevention, evaluation, and treatment of acute stroke. USA: Professional Communications, Inc.

AHA (2018), Heart Disease and Stroke Statistics 2018 At-a-Glance. Retrieved fromhttps://www.heart.org/-/media/data-import/downloadables/heart-disease-and-stroke-statistics-2018-at-a-glance-ucm_498848.pdf

Black, MJ & Hawks, HJ (2005). Medical-surgical nursing: Clinical management for positive outcomes (7th Ed). St. Louis: Elsevier Inc.

Carpenito, LJ (2007). Nursing Diagnosis Pocket Book. Issue 10. Jakarta: EGC.

Feigin, N. (2017). Global Burden of Stroke. Stroke Compendium, 120, 439-448. Available on:https://www.ahajournals.org/doi/10.1161/CIRCRESAHA.116.308413 [Downloaded: 15 December 2019].

Kogan, E. (2020). Assessing stroke saverity using electronic health record data: a machine learning approach. BMS Medical Informatics and Decision Making. Vol. 20(8). Matter. 1-8. [Internet]. Available on:https://bmcmedinformdecismak.biomedcentral.com/track/pdf/10.1186/s12911-019-1010-x.pdf[accessed February 12, 2021].

Kolapo, KO, Ogun, SA, Daresi, MA, Osalusi, BA, & Odusote, KA (2006). Validation study of the Siriraj Stroke Score in African Nigerians and evaluation of the discriminant values of its parameters: A preliminary prospective CT-Scan study. Journal of the American Heart Association. 37. 1997-2000. doi: 10.1161/01. STR. 0000229893.02732.02.

Li, Q, X. (2020). Application values of six scoring systems in the prognosis of stroke patients. Frontiers in Neurology. Vol. 10(1416). Matter. 1-7. [Internet]. Available at: https://www.frontiersin.org/articles/10.3389/fneur.2019.01416/full [accessed 12 February 2021].

Lyden, DP D (2018). NIH Stroke Scale/Score (NIHSS). Retrieved from http:www.mdcale.com/nih-stroke-score-nihss.

McGee, S. (2012). Evidence-based physical diagnostics. 3rd Ed. Philadelphia: Saunders Elsevier.

Mohtar, MS (2019). Duration Relationship Help Damage of Patients with Stroke Neurological in Ulin Hospital Banjarmasin. Health Dynamics Journal of Midwifery and Nursing. Vol. 10(1). Matter. 224-238.

Mohtar, M., S. (2021). Assessment Collection Stroke Focus Neurological Deficit in Emergency and Critical Care. Vol. 1(52). ISBN: 978-620-4-72501-7. LAP LAMBERT Academic Publishing, Ukraine.

Mohtar, MS (2022). e-Counseling Education Services (e-CES) Effect on Quality of Life Post-Stroke Patients During the Covid-19 Pandemic. Nursing Journal window. Vol. 6(1). Matter. 24-33.

Nyodu, T., Singh, KB, Singh, J., Kenny, S., Singh, LD, & Singh, MK (2013). A comparison of clinical diagnosis with computed tomography findings in stroke patients. Journal of Medicine Society. 27(3).

Pavan, Madi, Achappa, & Unnikrishnan. (2012). Comparison of Siriraj Stroke Score with computerized tomography in ascertaining stroke type among South Indians. int. Journal of Biological & Medical Research. 3(3), 1930-1933.

Pujiastuti, D. (2017). The importance of siriraj stroke score in the emergency department. Health Journal. Vol. 5(1). Matter. 8-14. [Internet]. Available on:http://jurnal.stikesbethesda.ac.id/index.php/jurnalkesehatan/article/view/75/66[accessed January 05, 2021].

Riskesdas. (2018). Basic Health Research. 91. Retrieved fromhttp://www.depkes.go.id/resources/download/info-terkini/materi_rakorpop_2018/Hasil Riskesdas 2018.pdf

Sacco Ralph L, Scott EK, Joseph PB, Louis R Caplan, et al. (2013). An Update Definition of Stroke for the 21st Century. AHA/ASA Expert Consensus Document. 2013:2064-2085.

Salawu, F., Umar, I., & Danburam, A. (2009). Comparison of two hospital stroke scores with computerized tomography in ascertaining stroke type among Nigerians. Annals of African Medicine. 8(1), 14-18.

Saudin, D. (2020). Comparison of Siriraj Score (SS) and Gajah Mada Algorithm (AGM) for stroke cases in the Emergency Room of RSUD Dr. Soedono Madison. Edunursing Journal. Vol. 4(1). Matter. 29-33. [Internet]. Available on:https://journal.unipdu.ac.id/index.php/edunursing/article/view/2303[accessed June 16, 2021].

Smeltzer, SC, Bare, BG, Cheever, KH, & Hinkle, J. (2008). Brunner & Suddarth's textbook of medical-surgical nursing (11th Ed). Philadelphia: Lippincott and Wilkins.