

ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCE
SCHOOL OF MEDICINE
DEPARTMENT OF NEUROLOGY



RESEARCH THESIS

**ASSESSMENT OF KNOWLEDGE, ATTITUDE AND
PRACTICE IN IDENTIFICATION OF EARLY NEUROLOGIC
DETERIORATION IN STROKE PATIENTS AMONG
HEALTH PROFESSIONALS IN ADDIS ABABA, ETHIOPIA**

INVESTIGATOR

NARDOS ASFAW (NEUROLOGY RESIDENT)

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NARDOS ASFAW (NEUROLOGY RESIDENT)

ADVISORS

- 1. DR. GUTA ZENEBE (MD, Internist and Neurologist, Assoc. Prof)**
- 2. DR. SEID ALI (MD, Internist and Neurologist, Assoc. Prof)**
- 3. DR. HANNA DEMISSIE (MD, Consultant Neurologist, Ass. Prof)**
- 4. DR. HUSSIEN NURI (MD, Consultant Neurologist, Asst, Prof)**

Addis Ababa University, College of Health Science

Addis Ababa, Ethiopia.

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ABSTRACT

Background: - Worldwide, Stroke is the second most common cause of mortality and disability. In Ethiopia stroke is the 5th cause of death accounting 7% from the top 10 causes of death. Post stroke neurological deterioration is a significant clinical condition that affects up to a third of patients. Early neurological deterioration in stroke patients is a common event and is associated with poor outcomes. Therefore, attempts to prevent and treat early neurological deterioration should be made promptly and aggressively. Although studies have found that being aware of common causes of neurological deterioration can help for optimal care and preventive measures, so far there is no publication as to the knowledge and practice in identification of early neurological deterioration and associated factors in stroke patients among health professionals done in Ethiopia.

Objective: To assess the knowledge, attitude, and practice towards identification of early neurologic deterioration in stroke patients among health care professionals in Addis Ababa Ethiopia.

Methods: -We conducted a Facility based cross sectional analysis of data collected from June 2021 to September 2021 from 214 health professionals who are mostly involved in the care of stroke patients. Participants filled out pretested self-administered questionnaire. It includes demographic information, three sections to assess knowledge, practice and attitude towards early neurologic deterioration in stroke patient. Data was entered in to SPSS version 25. Categorical variables were summarized by frequency and percentages. Associations were done by binary and multivariable logistic regression to see the association between Knowledge-attitude, Knowledge-Practice and Practice-attitude.

Results:-A total of 209 study participants responded to the study questions among a total of 214 participants making the response rate of 97.6%. Most of the respondents were male 114(54.5%). The mean age of the study participant is 29+/- 3.9. Nurses account for largest number of respondents 101(48.3%) followed by internal medicine residents 46(22%). Majority of respondents 111(53.1%) were from TASH, 41(19.6%) from Zewditu memorial hospital, The mean knowledge score of general practitioners and residents was 9.3 and the majority of internal medicine and Neurology residents scored above 9.3. Higher numbers of respondents 71.8% have positive attitude towards the causes of early neurologic deterioration in stroke patients could be prevented. Individuals who have training on acute care for stroke patients had 2.8 times (AOR = 2.8, CI = 1.4, 6.8) and neurological residents had 6.6 times (AOR = 6.6, CI = 1.2, 7.4) more likely to have stroke knowledge. Regarding stroke knowledge level, knowledgeable subjects had 2.7 times (AOR = 2.7, CI = 1.3, 3.5) more likely to have positive attitude towards stroke related early neurological deterioration as compared to those who were not knowledgeable. Health professionals below age 24 year were 0.58 times (AOR = 0.58, CI = 0.16, 2.1) less likely to practice preventive measures of early neurologic deterioration than those within the age range between 34-44.

Conclusion:-This study leads to the belief that there is a crucial need to rationalize and update knowledge regarding the predictors of early neurologic deterioration and preventive measures. It is important to have and use hospital based protocols to achieve optimum patient outcome and high quality of interdisciplinary care. Assessment to knowledge gap, current practice and attitude helps to fill the gaps as well as for provision of comprehensive, interactive and holistic approach to acute care of stroke and rehabilitation.

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Acronyms and abbreviations

AHA-American Heart association

CNS-Central nervous system

CDC-Centers for disease control

CI-Confidence interval

DALYs-Disability adjusted life year

DR- Doctor

END-Early neurological deterioration

ED-Emergency department

EDE-Early deteriorating episode

EPSS-European progressing stroke study

GCS-Glasgow coma scale

ICH-Intracerebral hemorrhage

ICU-Intensive care unit

KAP-Knowledge, Attitude, Practice

MI-Myocardial infarction

MCM- Myung Sung Christian Medical center

NIHSS-National institute of health stroke scale

Prof-Professor

SAH-Subarachnoid hemorrhage

SPSS-Statistical package for social science students

SSS-Scandinavian Stroke Scale

TASH-TikurAnbesa Specialized Hospital

US-United states

VTE-Venous Thromboembolism

WHO-World health organization

ZMH-Zewditu Memorial Hospital

1. Introduction

BACKGROUND

The World Health Organization defines stroke as “rapidly developing clinical signs of focal or global disturbance of cerebral function, with symptoms lasting 24 hours or longer or leading to death, with no apparent cause other than vascular origin”. (1)

Worldwide, stroke is the second most common cause of mortality and disability. The overall rate of stroke related mortality is decreasing in high- and low-income countries, but the absolute number of people with stroke, stroke survivors, stroke related deaths, and global burden of stroke related disability is high and increasing. (2, 3)

In Ethiopia stroke is the 5th cause of death accounting 7% from the top 10 causes of death according to CDC 2016 report. Unlike developed countries hemorrhagic stroke has been reported to be more prevalent in sub-Saharan Africa. (4)

Early neurological deterioration is common affecting 26–43% of patients and nearly half of all cases occur within 24 hours after admission.(5)

Many factors hinder the practice of effective acute stroke management, particularly in low- and middle-income countries. Evidences from reviews confirm the widespread assertion of low applicability and uptake of evidence based acute stroke care in low and middle income countries. (6)

STATEMENT OF THE PROBLEM

Neurological deterioration which is an increase in the National Institutes of Health Stroke Scale (NIHSS) (stroke severity score, with higher scores representing more severe strokes) by 2 or more points within a 24-hour period during hospitalization, has been associated with poorer prognosis when compared to patients who do not deteriorate (7).

During acute hospitalization, up to one-third of patients with stroke develop early neurological deterioration. (8)

According to one study on early neurological deterioration in stroke patients, 44% of those with early neurological deterioration died in the hospital, and 35% of those who survived were hospitalized. (5). These mortality rates are higher than those reported in previous studies: one study found 19% at discharge and 24% at 6 months, while another found 33% at 3 months. (5)

Identifying predictors of early neurological deterioration is crucial because early treatment can help to prevent this serious complication. The fundamental measure to prevent early neurological deterioration is the admission of patients with acute stroke in a stroke unit with comprehensive management by neurologists who are experts in CVD. (9)

Studies suggest that intensive style of stroke unit care could almost halve the number of deaths within the first 3 weeks (from 14-8%) it has been suggested that this could be a result of preventing early neurologic deterioration.(1)

Data from a review of Medicare claims show that in the United States only 9.8% of stroke patients have a neurologist as their attending physician. Therefore, the vast majority of stroke patients are cared for primarily by non-neurologists (internists or general practitioners) who may receive limited input from a neurologist on a consultative basis. (11)

Improved training of internists and general practitioners in stroke, combined with more timely recognition and treatment of stroke patients, may help to alleviate much of the nihilistic attitude toward stroke that currently exists in the medical community.

Multiple settings and health care disciplines are involved in the stroke care pathway which encompasses several dimensions of care including acute care phase, treatment of medical

complications, patient counseling and secondary prevention, health care professionals working within this pathway must display diverse and special competences and be highly involved and adopt a multidisciplinary attitude .(12)

In Ethiopia, Neuro-medical complications were common and major factors contributing to mortality. According to a study done in a Jimma referral hospital in Ethiopia, 45.7% of admitted stroke patients developed neurological complications. (13)

Due to a lack of appropriate treatment and diagnostic agents for etiologic investigation, as well as skilled manpower, the hospital's stroke management protocol was suboptimal and lagging behind the recommended guidelines.

Being aware of the type of common complications and associated risk factors helps clinical team involved in the care of stroke patients to make preparation and plans for the best possible care and also to take appropriate preventive measures.(2)

Although the importance of awareness on early neurological deterioration in stroke patients shown to benefit for development of preventive protocols and reduce these complications, data assessing KAP of clinical team caring stroke patients are limited.

SIGNIFICANCE OF THE STUDY

In Ethiopia, majority of stroke patients receive acute care at ED, ward and MICU from nurses, emergency physicians, interns, IM residents, family medicine physicians, neurology residents and neurologists. This study focuses among these health workers in order to assess the gaps in knowledge, attitude and practice so as to increase the knowledge on early neurologic deterioration in stroke patients to give practice changing trainings and improve quality of care being delivered to the patients and help minimize the rate of morbidity and mortality associated with these complications and help for optimal outcome.

Assessing the gaps of KAP can help for understanding the need to have programmed training sessions which would help the clinical team caring for stroke patients update on new guidelines while on practice.

A heightened awareness of commonly encountered early and late medical complications of stroke along with knowledge of how to prevent and manage them can help to improve patient outcome, decrease the length of hospital stays and readmission rates and decrease overall health care costs and creates opportunity for institutions to see more patients decrease the crowded and improve quality of care.

Studies suggest that Intensive style of Stroke unit care could almost half the number of deaths with the 1st 3weeks from 14%-8%, it has been suggested that this could be a result of preventing early neurological deterioration. (15)

After assessing the knowledge and practice gaps, policy makers and support groups can be involved in developing national guidelines on the line of early neurologic deterioration in stroke patient and the need to have stroke units with more trained staff can be addressed in collaboration with this groups.

Literature Review

Early Neurologic deterioration is defined as clinical worsening or recurrence during the 1st 24-72hrs after stroke. (16)

Neurological deterioration arises in up to 40% of subjects after acute stroke during hospitalization and is followed by neurological and functional debility. Sequential observations, in depth analysis, and skilled professionals in specific stroke centers are crucial in early recognition, prevention and management of neurological deterioration in acute stroke patients. (17)

Process of secondary neuronal damage can occur very quickly after initial stroke and any attempt to halt the process should be made aggressively and urgently. Acute stroke unit care is increasingly characterized by intensive physiological monitoring and correction of abnormal parameters such as fever, hyperglycemia, hypoxia and dehydration. (5)

Stroke unit care is effective in reducing morbidity and mortality compared to conventional stroke care in general medical ward. Better outcome seems to be related to several factors such as early treatment, mobilization and careful monitoring of stroke patients is supported by evidences that fever, Hypo/hypertension, cardiac arrhythmia, hypoxia play an important role in determining a poor or good outcome.(18)

Reduction in early death is believed to be due to monitoring and control of abnormal physiological parameters such as hypotension, hyperglycemia, hypoxia, pyrexia and hydration which in acute phase may have aggravated cerebral damage. Monitoring of acute physiologic parameters with treatment aimed at maintaining physiological homeostasis also reduced early neurological progression in a pilot study. (19)

Qualitative interviews done in Ghana study identified four key potential barriers impeding implementation of evidence-based acute stroke care, health system (inadequate medical facilities, lack of stroke care protocol, limited staff, inadequate staff development opportunities and health professionals poor collaboration limited knowledge of stroke care interventions. Perceived barriers varied across professional disciplines and hospitals. (20)

Effective post stroke care is essential to improve outcome for both patients and families however, limited skills and competence as well as low levels of awareness and knowledge represent barriers to optimal evidence based practice in stroke care. (21)

In one study done in Pakistan, quite often the first likely contact of stroke patients will be a local general practitioner yet there was a very inadequate knowledge seen regarding blood pressure control and management of blood glucose. In the study 25% of them chose dextrose to be the intravenous fluid of choice in patients with acute stroke and 54% of practicing general physicians felt the need to aggressively manage hyperglycemia. (22)

The monitoring of body temperature, blood glucose and dysphagia is considered standard of care for all patients with stroke nonetheless, data from the 2019 Australian Stroke foundation national stroke audit indicated that fewer than half (48%) of patients with fever received acetaminophen/paracetamol within an hour and 55% of patients received a swallow screen/assessment before food or drink consumption. (23)

Similar gaps in temperature, blood glucose, and dysphagia monitoring and treatment have been identified from various studies internationally with inadequate nursing oversight for these core parameters. (24)

In a study done in New South Wales, Australia, the nurses have a duty of care to monitor patients regularly, particularly in acute phase and treat according to best evidence four hourly temperatures monitoring for the first 72hrs and the result indicate the monitoring and treatment for fever and hyperglycemia were suboptimal. Clinicians' adherence to guidelines for screening of all stroke patients for swallowing dysfunction is poor. (25)

Objectives

GENERAL OBJECTIVE

- To assess knowledge, attitude and practice in identification of early neurological deterioration in stroke patients and associated factors among health professionals in Addis Ababa Ethiopia, June-October 2021.

SPECIFIC OBJECTIVE

- To determine the level of knowledge towards early neurological deterioration of stroke patients among health professionals in Addis Ababa Ethiopia, June-October 2021.
- To identify the attitude of residents, nurses and general practitioners towards early neurological deterioration of stroke patients in Addis Ababa Ethiopia, June-October 2021.
- To assess the current practice regarding patient care with early neurological deterioration in stroke patients in Addis Ababa Ethiopia, June-October 2021.
- To identify factors associated with Knowledge, attitude and Practice among Health professionals toward identification of early neurological deterioration in Addis Ababa, Ethiopia, June-October 2021.

Methods and materials

STUDY AREA

The study was conducted in TASH, Zewditu memorial Hospital, Yekatit 12 Hospital, Yehuleshet clinic and Myung Sung Christian Medical center. These are main government owned tertiary hospitals and private owned clinic and medical center which offers comprehensive health care service through specialty clinics and inpatient service department. In facilities such as Zewditu memorial hospital, Yekatit 12 hospital, Yehuleshet clinic and Myung Sung Christian Medical center, care is provided to stroke patients in acute phase by general practitioners, Nurses and Neurologists where as in Black lion hospital emergency physicians, IM residents, Family medicine residents, Neurology residents, neurologists and nurses are involved. The study was conducted among health professionals working in areas with in the hospital in which stroke patients in acute phase get service such as inpatient neurology/medical ward, medical ICU and Emergency room.

STUDY PERIOD

The study was conducted from June1-September 31, 2021

STUDY DESIGN

Facility based quantitative cross-sectional study was employed using self-administered questionnaires among health professionals (nurses, residents and general practitioners) in selected hospitals TASH, Zewditu memorial Hospital, Yekatit 12 Hospitals, Yehuleshet clinic, Myung Sung Christian Medical center.

SOURCE POPULATION

The source populations are health professionals who are mostly involved in the care of stroke patients at medical ICU, Emergency room and inpatient medical or neurology ward. This includes nurses, general practitioners, residents (Neurology, internal medicine, Family medicine and emergency and critical care medicine.

Those residents from specific departments are selected because they have major role in the care of stroke patients and after completion of their specialty training; they are most likely to encounter patients with stroke.

STUDY POPULATION

Randomly selected health professionals who are mostly involved in the care of stroke patients at MICU, ER and Inpatient Neurology ward and this includes nurses, interns, general practitioner's neurology, Emergency and family medicine residents assigned to work at these areas.

INCLUSION CRITERIA

- Neurology, internal medicine, family medicine and emergency medicine residents, nurses, and general practitioners.

EXCLUSION CRITERIA

- Health professionals other than Neurology, internal medicine, family medicine and emergency medicine residents, nurses, and general practitioners.
- Health professionals who are not volunteer.

SAMPLING

Sampling technique

Due to the heterogeneous composition of the study subjects, stratified sampling technique was used.

Sample size Determination

Sample size was calculated using a single proportion sample size estimating formula.

$$n = \frac{Z^2 * p * q}{d^2}$$

n=384

Where: **n** = the sample size

Z confidence interval expressed in z-score 0.05 = 1.96

p = since there are no previous researches done on this topic the estimated prevalence will be taken as 50%

q: 1 - p

d: margin of error = 0.05

KAP towards early neurologic deterioration in stroke among health professionals

Total population N= 482

$nf = \frac{n}{N}$

$1 + \frac{n}{N}$

N

Final sample size $nf=213$ adding 10% non-respondent final sample size=234 and pilot study was done on 20 participants and not included in the final study.

Percentage of sample size

Calculated with stratified sampling technique is as follows

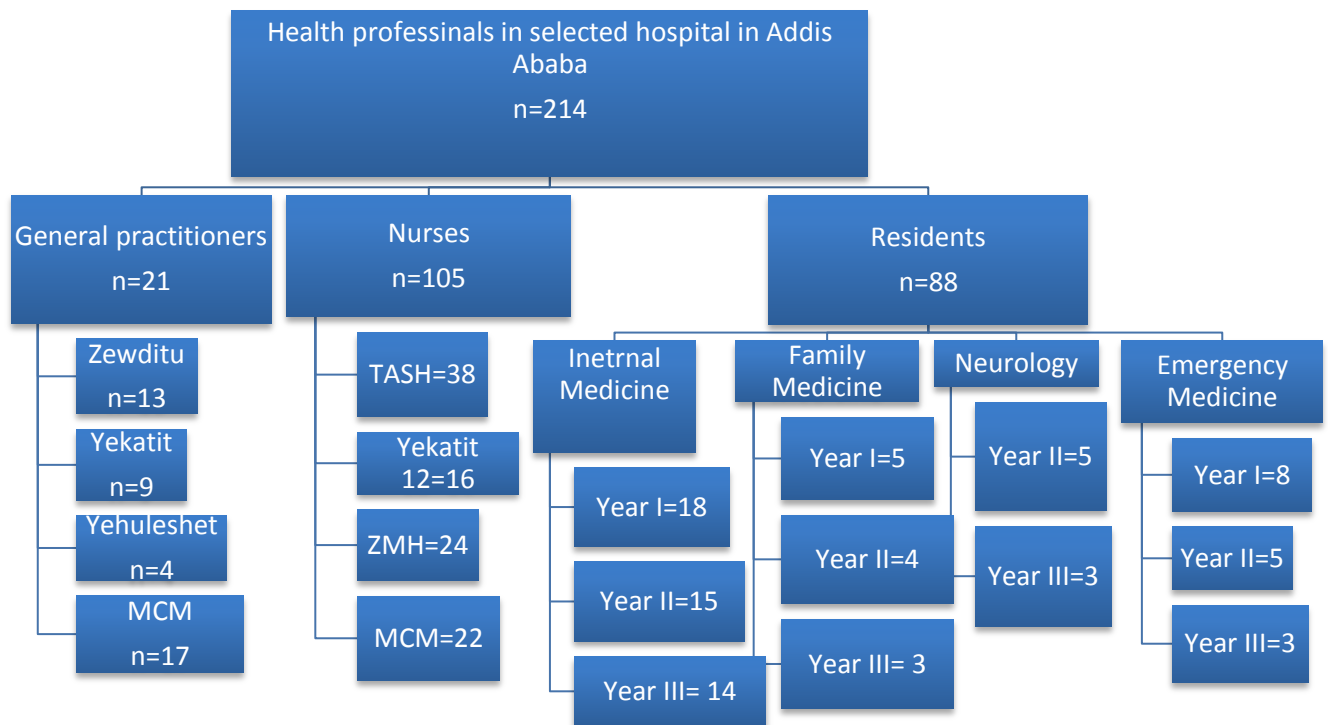


Figure 1 Population size and distribution among health professionals in TASH, Yekatit 12, Zewditu memorial, Yehuleshet clinic and MCM

Variables

INDEPENDENT VARIABLES

- Age
- Year of experience
- Duration of practice
- Current working facility
- Current working unit
- Type of profession
- Training on stroke acute care

DEPENDENT VARIABLES

- Knowledge of predictors of Early neurologic deterioration in stroke patients
- Practice of care for early neurologic deterioration in stroke patients
- Attitude towards preventive measures

DATA COLLECTION

After informed consent, the health professionals were requested to fill out questionnaire administered via Google form which was designed to assess the knowledge, practice and attitude towards early neurological deterioration among stroke patients.

The questionnaire is constructed to assess basic knowledge regarding early neurological deterioration in stroke patients and attitude towards its significance as well as current practice after literature reviews. It consists of a total of 32 questions with four sections first one general part on socio-demographic characteristics and the other 3 sections on assessment of knowledge, attitude and practice.

A pilot study was done on 20 participants and questionnaire was modified accordingly.

Those participants in the pilot study were not included in the main study.

DATA ANALYSIS

The data was cleaned for significant missing values and completeness. It was then entered into SPSS version 25. To analyze the data, knowledge participants answered “Yes” was considered as correctly answered and those who answered “No” and “I don’t know” were considered as not answered correctly.

In descriptive analysis, variables were summarized by frequency and percentages. The Binary logistic regression analysis was done to see the independent effect of predictors on the dependent variables and predictors with $P\text{-value} < 0.25$ was entered into multivariate analysis to identify their independent effects. Odds ratio from logistic regression and $P\text{-value} < 0.05$ considered to show statistical significance and it will be used to identify their association with KAP of health professionals towards early identification of Neurological complications.

ETHICAL ISSUE

Proposal approval was obtained from the ethical review committee of the department of Neurology and Addis Ababa Health Bureau Public Health research and Emergency management directorate. Both verbal and written consent obtained from the participants. Anonymity and confidentiality of participants will be kept private.

DISSEMINATION OF THE RESULT

The results of this study will be submitted to the Department of Neurology, School of medicine, College of health science Addis Ababa University and will be disclosed to the respective units of the Hospital, health professionals and authorities.

LIMITATION OF THE STUDY

Interns were not included in the study, who is also the frontline care givers for stroke patients in acute phase

Limited number of Sample size and the study is done in limited hospitals situated only in the capital city Addis Ababa.

Health care professionals working below hospital level who deliver health service are not included.

OPERATIONAL DEFINITIONS

1. **Neurological Deterioration:** - Decrease of two or more points on GCS which measures patient's level of consciousness on a scale 3-15.

2. **END: - Early neurological deterioration**

- Defined as clinical worsening or recurrence during the first 72hrs after stroke.

-Decrease of two or more points in consciousness (motor power), decrease of 3 or more points in speech score between baseline and 24hrs after

-Increase NIHSS score by 2 or more points or stroke related death between admission and day 5.

3. **Mean knowledge score** for general practitioners and residents from a total of 13knowledge questions is 9.3 knowledgeable labeled as a score of above 9.3 and below 9.3 not knowledgeable. For the nurses from 5questions mean score above 1.96 labeled as knowledgeable and below not knowledgeable.

4. **Practice mean score:-**Above 9.4 labeled as good practice and below 9.4 labeled poor practice.

5. **Attitude mean score:-** Above 3 labeled as having positive attitude and below 3 labeled as having negative attitude.

Result

Demographic Characteristics of the health professionals

A total of 209 study participants responded to the study questions among a total of 214 participants making the response rate of 97.6%. Most of the respondents were male 114(54.5%).

With regard to age of health professionals, majority of respondents about 69.9 % were in the age group of 25-35 years. In addition, about 17.7% and 12.4% of participants have the age ranged from 36-44 and <24 years respectively. (Table1.)

Table 1: Age and sex of the health professionals in TASH, Yekatit 12, Zewditu memorial, Yehuleshet clinic and MCM from June to September, 2021

Respondents	Age		
	<24	25-35	36-44
	26(12.4%)	146(69.9%)	37(17.7%)
Respondents	Sex		
	Male	Female	
	114(54.5%)	95(45.5%)	

With regard to educational background of about 40.2 % of the nurse respondents were degree holders and 19.1 percent were Year II residents, in addition 14.4 percent were Year I residents. On the other hand, the least only 2.9% of the respondents were diploma holder among nurses.

KAP towards early neurologic deterioration in stroke among health professionals

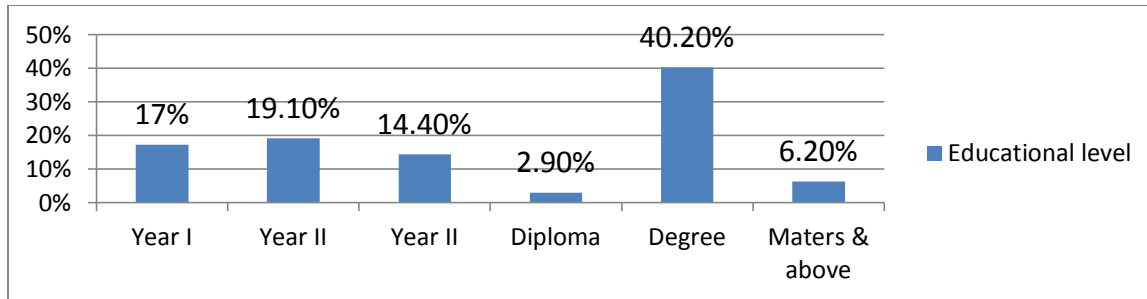


Figure 2. Proportion of Respondents based on educational level in TASH, Zewditu memorial, Yekatit 12 Hospital, Yehuleshet clinic and MCM from June to September 2021

The finding of educational category indicated, Nurses account for largest number of respondents 101(48.3%) followed by internal medicine residents 46(22%). On addition, 10 % of respondents were general practitioner.

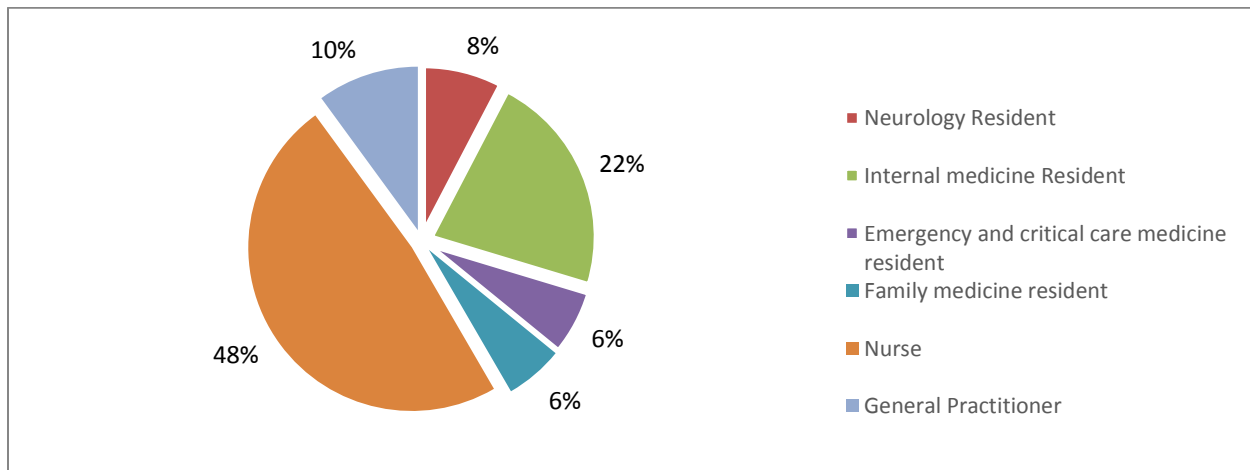


Figure 3 Proportion of Respondents based on the type of Profession in TASH, Zewditu memorial, Yekatit 12 Hospital, Yehuleshet clinic and MCM from June to September 2021

Regarding current working facility, Majority of respondents about 53.1 percent were from TASH and about 19.6% from Zewditu memorial hospital and majority participant working units 40.2% of participants work at general Internal medicine ward and 33.5 % works at emergency room and 13.9% work at neurology ward.

Table 2: Current working facility and current working unit of the health professionals in TASH, Zewditu memorial, Yekatit 12 Hospital, Yehuleshet clinic and MCM from June to September 2021

Respondents	Current Working Facility				
	TASH	Yekatit Hospital	Zewditu Memorial Hospital	Yehuleshet Clinic	Myung Sung Christian Medical Center
Health Professionals	111(53.1%)	21(10%)	41(19.6%)	8(3.8%)	28(13.4%)
Respondents	Current Working Unit				
	Emergency room	Medical ICU	Neurology Ward	General internal medicine ward	
Health Professionals	70(33.5%)	26(12.4%)	29(13.9%)	84(40.2%)	

The rest experience of respondents, majority of respondents about 60.8 % has less than 5 year experience and 39.2 % of health professionals has greater than 5 year experience.

Table 3 : Year of experience and training concerning acute care for stroke patients of the health professionals in TASH, Zewditu memorial, Yekatit 12 Hospital, Yehuleshet clinic and MCM from June to September 2021

Respondents	Year of Experience		Do you had any training concerning acute care for stroke patients	
	More than 5 years	Less than 5 years	Yes	No
Health Professionals	82(39.2%)	127(60.8%)	29(13.9%)	84(40.2%)

KNOWLEDGE OF HEALTH PROFESSIONALS TOWARDS EARLY NEUROLOGIC DETERIORATION IN STROKE PATIENT

From the total of 13 basic questions asked, the most correctly answered question among health professionals were Electrolyte disturbance doesn't affect the level of consciousness and 76% of health professionals were knowledgeable. On the other hand, the most incorrectly answered questions by about 77% of the respondent is the question "all patients with stroke in acute phase should be supplemented with IV fluid" followed by the questions "The time frame to define Early neurological deterioration in stroke patient is 72hours" was incorrectly answered by 61.7% of the respondents. . Another most incorrectly answered question was the question "a drop in GCS is not helpful parameter for assessing neurologic deterioration this question was incorrectly answered by 56.5% of the respondents.

Table 4: Participant's response on knowledge towards early neurological deterioration of stroke patients in TASH, Zewditu memorial, Yekatit 12 Hospital, Yehuleshet clinic and MCM from June to September 2021

S.N	Statement	Responses			
		correct		Incorrect	
		frequency	percentage	frequency	Percentage
1.	The time frame to define Early neurological deterioration in stroke patient is 72hours	80	38.3	129	61.7
2.	A drop in GCS is not helpful parameter to assess early neurological deterioration in stroke patients.	91	43.5	118	56.5
3.	Vital sign derangement is among the important parameters to assess early neurological deterioration in stroke patients.	98	46.9	111	53.1
4.	Persistent in-hospital hyperglycemia during the first 24hours after acute stroke is associated with worsen stroke outcome	100	47.8	109	52.2
5	Elevated temperature doesn't increase the risk of ischemic injury in acute stroke	94	45	115	55

KAP towards early neurologic deterioration in stroke among health professionals

6	Do you know about NIHSS (National institutes of health stroke scale)	70	33.5	139	66.5
7.	Which NIHSS Parameter can be used to detect early neurological deterioration?	60	28.7	149	71.3
8.	Electrolyte disturbance has significant association with stroke severity?	90	43.1	119	56.9
9	All patients with acute stroke have to be supplemented with IV fluid	48	23	161	77
10.	Fluid administration in acute stroke care depends on the measure of blood pressure	49	23.4	149	71.3
11.	Dysphagia is a major risk factor for developing aspiration pneumonia	141	67.5	68	32.5
12.	Electrolyte disturbance doesn't affect the level of consciousness	160	76.6	49	23.4
13.	The preferred choice of fluid to administer in acute care of stroke patients is	126	60.3	83	39.7

The question on dysphagia is a major risk factor for developing aspiration pneumonia was correctly answered by 67.5 % of respondents.

On the preferred choice of fluid to administer in acute care of stroke patients was correctly answered by 60%.

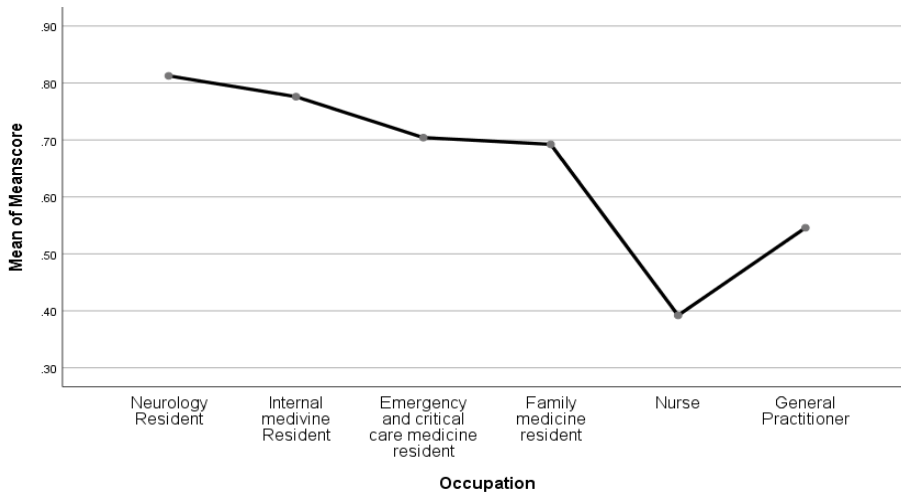
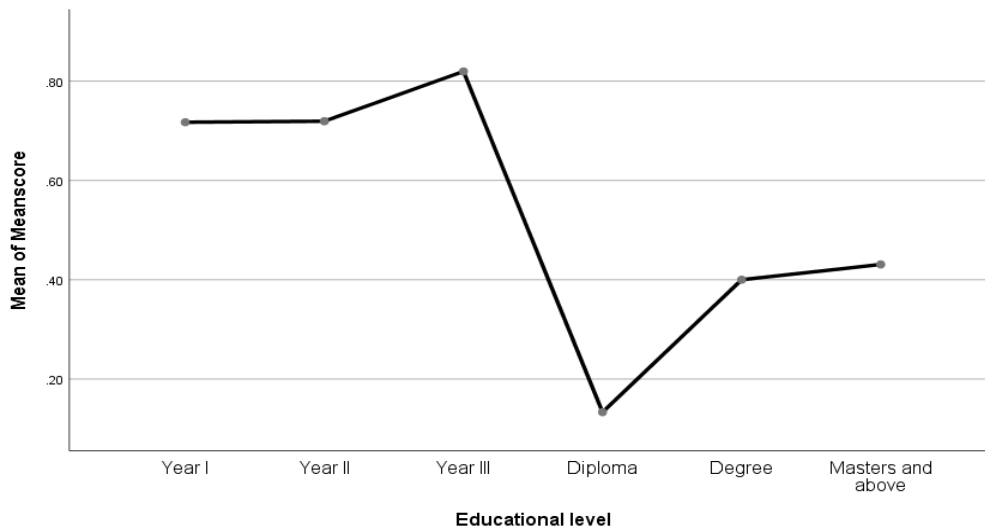
Table 5. Total knowledge mean score of health professionals in TASH, Yekatit 12, Zewditu memorial, Yehuleshet clinic and MCM from June to September 2021

Respondents	Mean score (Percentage)
Neurology residents	78.72%
Internal medicine residents	77.9%
Emergency medicine	75.55%

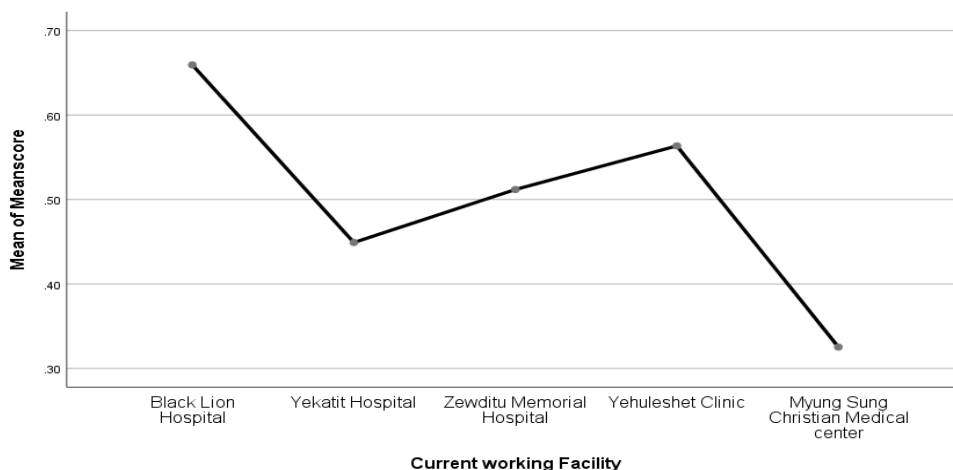
KAP towards early neurologic deterioration in stroke among health professionals

Family medicine	75.48%
Nurses	64.8%
General practitioners	70.49%

Figure 4. Mean score difference between health professionals, working facility and educational level TASH, Zewditu memorial, Yekatit 12 Hospital, Yehuleshet clinic and MCM from June to September, 2021



KAP towards early neurologic deterioration in stroke among health professionals



ATTITUDE OF HEALTH PROFESSIONALS TOWARDS EARLY NEUROLOGICAL DETERIORATION OF STROKE PATIENTS.

Most of the health professionals 71.8 % believe causes for acute deterioration in stroke can be prevented. The majority of the health professional about 80.4% think it is important to have swallow test for all patients with stroke before initiating Po feeding. The majority of the health professionals 87.1% believes that update lectures can improve quality of care given for stroke patients.(Table 5)

Table 6: Participant's response on attitude towards early neurological deterioration of stroke patients in TASH, Zewditu memorial, Yekatit 12 Hospital, Yehuleshet clinic and MCM from June to September 2021

S.N	Statement	Responses			
		correct		Incorrect	
		frequency	percentage	frequency	Percentage
1.	Do you believe that causes for acute deterioration in stroke can be prevented?	150	71.8	59	28.2

KAP towards early neurologic deterioration in stroke among health professionals

2.	Do you think it is important to have swallow test for all patients with stroke before initiating Po feeding	168	80.4	41	19.6
3.	Do you believe that all stroke patients should be supplemented with oxygen?	135	64.6	74	35.4
4.	Do you believe that update lectures can improve quality of care given for stroke patients?	182	87.1	27	12.9

With regard to the health care associated contributor for early neurological deterioration in stroke patients, 72% of the respondents indicated there is under estimation of the disease. In addition, the respondents were asked who is responsible in detecting early neurological deterioration in stroke patients, majority of the respondents about 80% believed to work in team. 89% of the respondents believe lack of training contributes to improper use of neuro-sign chart.

PRACTICE OF HEALTH PROFESSIONALS TOWARDS EARLY NEUROLOGICAL DETERIORATION OF STROKE PATIENTS.

The next thematic area to be the practice of health professionals towards neurological deterioration, From the total of 17 basic questions asked, the most correctly answered question among health professionals were “Have you ever put a stroke patient in acute care on oxygen? And 85.2% of health professionals practice it, On the other hand the least correctly practice were the practice as to which patient to put on IV fluid, where by only 21% practiced correctly. The next question with the highest frequency of wrong answer was the question about “Which group of patients to put on oxygen” about 78.5% of health professionals were practicing correctly.

Table 7 Practice response of participants towards early neurological deterioration of stroke patients in TASH, Zewditu memorial, Yekatit 12 Hospital, Yehuleshet clinic and MCM from June to September

2021

S.N	Statement	Responses			
		correct		Incorrect	
		frequency	percentage	frequency	Percentage
1.	In your practice, do you measure the temperature of stroke patients in acute phase?	150	71.8	59	28.2
2.	How frequent do you measure body temperature in	57	27.3	152	72.7
3.	How frequent do you measure body temperature in afebrile stroke patients?	132	63.2	77	36.8
4.	When do you intervene for elevated temperature in acute stroke?	76	36.4	133	63.6
5	Which method do you use to decrease elevated temperature?	151	72.2	58	27.8
6	Do you administer IV fluid to stroke patients in acute phase	70	33.5	139	66.5
7.	If the answer to question No.6 is yes Which patients do you put on IV fluid?	44	21	165	78.9
8.	Do you assess stroke patient's fluid balance?	168	80.4	41	19.6
9.	How often do you follow fluid balance?	153	73.2	56	26.8
10.	Do you perform swallow test before initiating po feeding?	151	72.2	58	27.8
11.	How frequent do you take serum glucose measurement?	135	64.6	74	35.4
12	In your practice, when do you initiate DVT prophylaxis, In Ischemic stroke	98	46.9	111	53.1
13.	In your practice, when do you initiate DVT prophylaxis, In Hemorrhagic stroke,	107	51.2	102	48.8
14.	Have you ever put a stroke patient in acute care on oxygen?	178	85.2	31	14.8

KAP towards early neurologic deterioration in stroke among health professionals

15.	Which group of patients do you put on oxygen?	45	21.5	164	78.5
16.	How frequent do you send laboratory request to assess electrolyte abnormalities?	152	72.7	57	27.3
17.	How often do you use neuro-sign chart to follow a stroke patient?	106	50.7	103	49.3

The last two questions indicated, the 16th question on the frequency to send laboratory request to assess electrolyte abnormalities and was correctly answered by 67.5 % of respondents. Finally the respondents were as asked how often do you use neuro-sign chart to follow a stroke patient and 50.7 % was correctly answered.

Factors associated with participant's knowledge level towards early neurological deteriorations

Among variable entered in the bi-variate analysis participants, Type of Profession, level of education, experience, current working unit and training concerning acute care for stroke patients showed significant associations with P-value <0.05. Variables with P-value ≤ 0.25 were entered in the multivariable logistic analysis and some of the above association did not exist after adjustment for other variables.

Table 8. Bi-Variable logistic regression predicting early neurological deterioration related knowledge among health professionals in TASH, Zewditu memorial, Yekatit 12 Hospital, Yehuleshet clinic and MCM from June to September 2021

Variables	Knowledge			
		AOR	95% CI	P-Value
Training	No	-	-	-
	Yes	2.8	1.4,6.8	0.001
Profession	Others	-	-	-
	Neurology residents	6.6	1.4,7.4	0.03
Nurses level of education	Masters and above	-	-	-

KAP towards early neurologic deterioration in stroke among health professionals

	Diploma	0.6	0.1,6.9	0.75
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In the multivariable logistic analysis, health professionals who are diploma holders were 0.6 times (AOR = 0.6, CI = 0.1, 6.9) less likely to have knowledge about early stroke deterioration as compared to those masters holders and above. Individuals who have got training on acute care for stroke patients had 2.8 times (AOR = 2.8, CI = 1.4, 6.8) more likely to have stroke knowledge as compared to those who did not get the training. Regarding the type of profession of the health professionals, neurological residents are 6.6 times (AOR = 6.6, CI = 1.2, 7.4) more likely to have knowledge as compared to other residents and general practitioners.

Factors associated with participant's attitude level towards early neurological deterioration

Age, Educational level category, occupational status, current working units, experience and training concerning acute care for stroke patients showed significant associations in the bivariate analysis. Some of these associations did not exist after adjustment for other variables. In the multivariable logistic regression analysis, Neurological residents had 7.2 times (AOR = 7.2, CI = 1.9, 7.8) more likely to have positive attitude towards early neurological deterioration in stroke patients as compared to General practitioners.

Table 9 Multivariable logistic regression predicting early neurological deterioration related Attitude among health professionals Attitude Parameter Estimates in TASH, Zewditu memorial, Yekatit 12 Hospital, Yehuleshet clinic and MCM from June to September 2021

Variables	Positive attitude			
		AOR	95% CI	P-Value
Neurology residents	Other residents	-	-	-
	General practitioners	7.2	1.9,7.8	0.02
Training	No	-	-	-
	Yes	2	1.4,2.7	0.01
Working at Neurology ward	No	-	-	-
	Yes	5.4	1.1,6.3	0.001
Level of education	Others	-	-	-
	Diploma	0.5	1,2	0.001
Mean score of knowledge	Below the mean	-	-	-
	Above the mean	2.7	1.3,3.5	0.002

Health professionals who had trained concerning acute care for stroke patients had 2 times (AOR = 2, CI = 1.4, 2.7) more likely to have positive attitude towards early neurological deterioration as compared to participants who were not trained. With regard to working unit, Respondents who works in neurological wards had 5.4 times (AOR = 5.4, CI = 1.1, 6.3) more likely to have positive attitude towards early neurological deterioration due to stroke as compared to those who work in wards other than Neurology. Furthermore, diploma holder health professional had 0.5 times (AOR = 0.5, CI = 1, 2) less likely to have positive attitude towards early neurological deterioration in stroke patients. Regarding stroke knowledge level, knowledgeable subjects had 2.7 times (AOR = 2.7, CI = 1.3, 3.5) more likely to have positive attitude towards stroke related early neurological deterioration as compared to those who were not knowledgeable. Positive attitude those with mean score >3.

Factors associated with participants practice level towards early neurologic deterioration in stroke

Age, Current working Facilities, occupation, educational level, experience, current working units, training on stroke effect on practice levels showed significant associations in the bivariate logistic regression analysis. In the multivariable analysis, health professionals below age 24 year were 0.58 times (AOR = 0.58, CI = 0.16, 2.1) less likely to practice than those who found within the range between 34-44 year. In terms of occupation, neurology residents are 8.6 times (AOR = 8.6, CI = 1.13, 9.73) more likely to practice than other professions, working at neurology ward had 3.2 times (AOR = 3.2, CI = 0.3, 3.83) more likely to have good practice than working at general medical ward. (Good practice labeled as mean score >9.4)

Table 10 Multivariable logistic regression predicting early neurological deterioration related Practice among health professionals Practice Parameter Estimates in TASH, Zewditu memorial, Yekatit 12 Hospital, Yehuleshet clinic and MCM from June to September 2021

Variables	Good Practice			
		AOR	95% CI	P-Value
Age	>24years	-	-	-
	<24years	0.58	0.16,2.1	0.001
Profession	Others	-	-	-
	Neurology residents	8.6	1.13,9.73	0.001

KAP towards early neurologic deterioration in stroke among health professionals

Working at Neurology ward	No			
	Yes	3.2	0.3,3.83	0.001
Attitude	Negative attitude			
	Positive attitude	2.8	1.1,7.4	0.001

Finally, having good attitude towards early neurological deterioration to stroke patients had 2.8 times (AOR = 2.8, CI = 1.1, 7.4) more likely to practice than those having poor attitude.

Discussion

Early neurologic deterioration in stroke patients which can occur in about 26-43% within 24-72hrs of stroke onset is common occurrence leading to increased morbidity, mortality and poor quality of life among stroke survivors. Efforts done to monitor and stabilize acute physiologic parameters within normal limit such as Blood pressure, temperature, hydration status, glucose level, oxygen saturation, dysphagia assessment has become standard practice in acute stroke care and these strategies may potentially reduce neuronal damage in acute phase and subsequently improve functional outcome and survival.

Skilled professionals are crucial in early recognition, prevention and management of early neurologic deterioration in stroke patients. This study tried to assess knowledge gap, current practice and attitude of health professionals towards early neurologic deterioration in stroke patients.

The data obtained from this study showed that most of the health professionals have general knowledge on recognition of the predictors of early neurologic deterioration in stroke patients but have a knowledge gap how to prevent its occurrence as well as on the management of specific physiologic parameter derangements.

The data analysis identified that, type of profession and level of education determined the mean score of knowledge and practice in addition to this current working place is shown to be associated with the attitude of health professionals.

The mean knowledge score of health professionals (general practitioners and residents) is 9.4 although there are no studies comparing mean knowledge score some studies specifically compare the knowledge and practice of general practitioners on glucose monitoring and IV fluid administration compared to what we found in this study in which only 21.1% of physicians put stroke patients in acute phase using the preferred IV fluid.

In one study done in Pakistan, quite often the first likely contact of stroke patients will be a local general practitioner yet there was a very inadequate knowledge seen regarding blood pressure control and management of blood glucose. In this study 25% of them chose dextrose to be the intravenous fluid of choice in patients with acute stroke and 54% of practicing general physicians felt the need to aggressively manage hyperglycemia.

The monitoring of body temperature, blood glucose and dysphagia is considered standard of care for all patients with stroke nonetheless, data from the 2019 Australian Stroke foundation national

stroke audit indicated that fewer than half (48%) of patients with fever received acetaminophen/paracetamol within an hour and 55% of patients received a swallow screen/assessment before food or drink consumption.

Comparing our study finding with the above study, the analysis showed that 27.3% of health professionals practice appropriate guideline based measurement of temperature in febrile acute stroke patients and among this only 36.4% practice guideline based monitoring of temperature in febrile stroke patients.

72.2% participants responded that they perform swallow test before initiating Po feeding, this figure is high compared to the Australian stroke foundation stroke audit which assessed the patients who received swallow screening this could be because the current study is collected from the health professionals who might respond positively to this question.

This study showed that nurses scored the lowest knowledge and practice mean score, especially with regard to the choice of fluid administration, when to administer, oxygen supplementation to stroke patients, assessment of swallowing dysfunction before initiating PO feeding when compared to a study done in New South Wales, Australia, the nurses have a duty of care to monitor patients regularly, particularly in acute phase and treat according to best evidence four hourly temperatures monitoring for the first 72hrs and the result indicate the monitoring and treatment for fever and hyperglycemia were suboptimal. Clinicians' adherence to guidelines for screening of all stroke patients for swallowing dysfunction is poor.

Higher numbers of respondents 71.8% have positive attitude towards the causes of early neurologic deterioration in stroke patients could be prevented.

Around 80.4% of the respondents believe that it is important to have swallow test for all patients with stroke before initiating PO feeding.

87.1% of the participants has positive attitude that update lectures can improve the quality of care given for stroke patients.

With regard to the health care associated contributor for early neurological deterioration in stroke patients, 72% of the respondents indicated that there is under estimation of the occurrence of early neurologic deterioration. In addition, the respondents were asked who is responsible in detecting early neurological deterioration in stroke patients, majority of the respondents about 80 %

believed to work in team. 89% of the respondents believe lack of training contributes to improper use of neuro-sign chart.

The findings indicates a need to improve the knowledge and practice of health workers as a lack of awareness may lead to poor quality of care, increased length of stay in the hospital and associated with morbidity and mortality.

LIMITATION- This study only addresses health professionals on limited health care delivery centers in Addis Ababa only and cannot be generalized. It didn't include the assessment of knowledge, practice and attitude of interns who are also the frontline care givers to stroke patients in acute phase.

CONCLUSION: - In general, there were a considerable limited knowledge about early neurological deterioration among health professionals, however individual who got training concerning acute care for stroke patients more knowledgeable and majority of the respondents specially neurological residents have good attitude toward early neurological deterioration and believes early neurologic deterioration in stroke patients could be prevented.. Having good attitude towards early neurological deterioration to stroke patients has positive association with practice and knowledgeable health profession had positive association with good attitude towards stroke related early neurological deterioration. This study leads to the belief that there is a crucial need to rationalize and update knowledge regarding the predictors of early neurologic deterioration and preventive measures. It is important to have and use hospital based protocols to achieve optimum patient outcome and high quality of interdisciplinary care. Assessment to knowledge gap, current practice and attitude helps to fill the gaps as well as for provision of comprehensive, interactive and holistic approach to acute care of stroke and rehabilitation.

RECOMMENDATIONS- It is good to consider delivery of training and education to multi-disciplinary groups and use of protocols/guidelines which tend to be associated with a positive impact on both patients outcome and quality of care. Taking this study as baseline future researches in larger sample size, in more private and governmental hospitals and in health professionals working outside of Addis Ababa can be done and important aspects of acute stroke care practice guidelines can be incorporated to undergraduate programs.

Annex
Annex 1

Table 11: Work plan

Tasks to be performed	Responsible persons	May 2020	June 2020	August 2020	November 2020	January to June 2021	July and August 2021	September, 2021	October 2021	November 2021
Proposal writing	PI									
Final Draft submission	PI									
Proposal defense	PI									
Further modification of proposal	PI and Advisors									
Data collection and analysis	PI and data collector									
First draft manuscript submission	PI									
Second draft thesis submitted to advisors	PI									
Thesis defense	PI									
Final thesis submitted to DRPC	PI									

Source of Budget

The research will be partly sponsored by the college of health science, and the rest will be covered by the investigator.

Table 11 Budget

No	Budget category	Unit cost	Multiplying factor	Total cost
1	Personnel	Daily Wage	Number of staff days (number of staffs*no of working days)	
	Data collector	250	1*15	3750
2	Transport	Cost per km	Number of km (no vehicles*no days*no km day)	
	Taxi	12birr	6*10*4.2km	3,024
3	Supplies			
	Questionnaire print	5birr per page	3*3	15
	Pen	20	20*20	200
	Pencil	5	5*5	25
	Eraser	2	2*5	10
	Photocopy	2birr per page	600*2	1200
	Sub total			2710
4	Personal protection materials			
	Face mask	200	15*200	3000
	Gloves	-	-	3000
	Subtotal			6000
5	Internet	1birr per min		6000
6	Total	-	-	21,484
7	Contingency (5%)		5%*total	1,074
8.	Grand total		Total +contingency	22,558

Table12. Socio-demographic characteristics of health professionals participated Knowledge, attitude and practice towards early neurologic deterioration in stroke patients in Addis Ababa, Ethiopia, 2021

			Frequency	Percentage
Age	<29		120	57.4%
	>=29		89	42.6%
Gender	Male		114	54.5%
	Female		95	45.5%
Profession	Residents	IM	46	22%
		FM	12	5.7%

KAP towards early neurologic deterioration in stroke among health professionals

		Neurology	16	7.7%
		Emergency	13	6.2%
	General practitioners		21	10%
	Nurses		101	48.3%
Level of education	Residents	Year I	31	16.5%
		Year II	32	17%
		Year III	26	13.8%
	Nurses	Diploma	3	1.6%
		Degree	83	39.7%
		Masters and above	13	6.2%
Working facility	Black lion hospital		111	53.1%
	Yekatit 12 Hospital		21	10%
	Zewditu Memorial Hospital		41	19.6%
	Yehuleshet clinic		8	3.8%
	Myung Sung Christian Medical center		28	13.4%
Current working unit	Emergency room		70	33.5%
	Medical ICU		25	12%
	Neurology ward		28	13.4%
	Ward other than Neurology		86	41.1%
Training	Yes		36	17.2%
	No		173	82.8%
Year of experience	Below 3years		82	39.2%
	Above 3years		127	60.8%

Table 13. Proportion of Correct answer among Health professionals (General Practitioner and Residents)

No	Items With T/F answers	% of correct answer	% of incorrect answer	Mean
1	The time frame to define Early neurological deterioration in stroke patient is 72hours	72.5%	27.5%	0.74
2	A drop in GCS is not helpful parameter to assess early neurological deterioration in stroke	88.1%	11.9%	0.84
3	Vital sign derangement is among the important parameters to assess early neurological	89%	11%	0.9
4	Persistent in-hospital hyperglycemia during the first 24hours after acute stroke is associated with	88.1%	11.9%	0.93

KAP towards early neurologic deterioration in stroke among health professionals

5	Elevated temperature doesn't increase the risk of ischemic injury in acute stroke	82.6%	17.4%	0.87
6	Do you know about NIHSS (National institutes of health stroke scale)	65%	34.9%	0.65
7	If the answer to question number 6 is yes, Which parameter can be used to assess early	61.5%	38.5%	0.55
8	Which electrolyte disturbance has significant association with stroke severity?	68.8%	31.2%	0.83
9	All patients with acute stroke have to be supplemented with IV fluid	29.4%	70.6%	0.23
10	Fluid administration in acute stroke care depends on the measure of blood pressure	39.4%	60.6%	0.23
11	Dysphagia is a major risk factor for developing aspiration pneumonia	83.5%	16.5%	0.7
12	Electrolyte disturbance doesn't affect the level of consciousness	88.1%	11.9%	0.77
13	The preferred choice of fluid to administer in acute care of stroke patients is	70.6%	29.4%	0.6

Table 14. Proportion of Correct answer among Health professionals (Nurses)

No	Items With T/F answers	% of correct answer	% of incorrect answer	Mean
9	All patients with acute stroke have to be supplemented with IV fluid	18.8%	81.2%	0.2
10	Fluid administration in acute stroke care depends on the measure of blood pressure	15.8%	84.2%	0.16
11	Dysphagia is a major risk factor for developing aspiration pneumonia	53.5%	46.5%	0.53
12	Electrolyte disturbance doesn't affect the level of consciousness	59.4%	40.6%	0.6
13	The preferred choice of fluid to administer in acute care of stroke patients is	48.5%	51.5%	0.5

Annex 2.

1. Knowledge logistic analysis

1.1 knowledge binary logistic analysis

Likelihood Ratio Tests

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	119.270 ^a	.000	0	.
Average number of stroke patients seen per month	120.412	8.142	1	.002
Age	120.469	11.199	2	.004
Current working Facility	129.933	10.663	4	.001
Occupation	139.130	19.860	5	.001
Educational level	122.102	7.833	5	.002
Current working unit	124.502	5.232	3	.003
Year of Experience	121.919	5.649	1	.004
Have you had any training concerning acute care for stroke patients	120.087	13.817	1	.003

Attitude logistic analysis

2.1 Attitude binary logistic analysis

Intercept	215.862 ^a	.000	0	.
Average number of stroke patients seen per month	218.774	13.912	1	.002
Age	216.969	18.107	2	.004
Current working Facility	217.679	21.817	4	0.03

KAP towards early neurologic deterioration in stroke among health professionals

Occupation	246.833	30.971	5	.000
Educational level	225.419	13.557	5	.001
Current working unit	223.580	18.718	3	.002
Year of Experience	219.210	23.348	1	.003
Have you had any training concerning acute care for stroke patients	215.947	12.085	1	.001
Knowledgelevel	216.472	12.610	1	.000

2. Practice logistic analysis

3.1 Practice binary logistic analysis

Likelihood Ratio Tests

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	207.409 ^a	.000	0	.
Average number of stroke patients seen per month	207.669	15.260	1	.000
Age	209.798	22.389	2	.000
Current working Facility	227.523	20.114	4	.000
Occupation	213.390	5.981	5	.002
Educational level	220.844	23.436	5	.000
Current working unit	208.851	11.442	3	.003
Year of Experience	208.090	13.682	1	.001
Have you had any training concerning acute care for stroke patients	207.776	17.368	1	.002

KAP towards early neurologic deterioration in stroke among health professionals

Attitude	211.943	24.534	1	.000
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Annex 3.

Consent Form

ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICE IN IDENTIFICATION OF EARLY NEUROLOGIC DETERIORATION IN STROKE PATIENTS AMONG HEALTH PROFESSIONALS IN ADDIS ABABA, ETHIOPIA

Dear survey Participant,

My Name is NardosAsfaw. I am a Third-year student of postgraduate Neurology Residency program in Addis Ababa University College of Health Science. I am doing a research as a completion for my residency program on my topic of interest assessing Knowledge, attitude, and practice towards Early neurological deterioration in stroke patients among health professionals in Addis Ababa, Ethiopia under the guidance of my advisors: -

1. DR. GUTA ZENEBE (MD, Internist and Neurologist, Assoc. Prof)
2. DR. SEID ALI (MD, Internist and Neurologist, Assoc. Prof)
3. DR. HANNA DEMISSIE (MD, Consultant Neurologist, Ass. Prof)
4. DR. HUSSIEN NURI (MD, Consultant Neurologist, Ass, Prof)

The objective of this study is to identify gaps associated with care of those patients with stroke and early neurological deterioration and to plan for future training programs and to improve the quality of care being delivered for the patients.

You may not directly benefit from this study. However, the results could contribute to formulate guidelines and helps to give practice changing updated trainings for health professionals.

I assure you that all the information obtained from you will be kept confidential and only be used for academic purpose. Filling the survey will take approximately 20-25 minutes. Your responses will remain anonymous so it doesn't include your name.

After reading the above statement, I sincerely request to participate and please fill and complete the survey. Your participation in this survey is completely voluntary. You may withdraw from participation at any time.

If any questions or concerns regarding this study you can contact me either via phone or email address written at the end.

Thank you for your kind cooperation.

Contact information- NardosAsfaw

Email Address-narasfaw@gmail.com Phone number -0913-52-73-71

QUESTIONNAIRE

Study number-----

PART 1: Socio-demographic characteristics (circle your choice)

1. Age_____

2. Current working facility

a. Black Lion hospital

b. Yekatit hospital

c. Zewditu memorial hospital

d. Yehuleshet Clinic

e. Myung Sung Christian Medical centre

3. Sex

a) Female

b) Male

4. Occupation

A. Resident

a) Neurology

b) Internal medicine

c) Emergency and critical care

d) Family medicine

B. Nurse

a. Emergency room

b. Intensive care unit

c. Neurology ward

C. General practitioner

5. Educational level

1. Resident
 - a) First year
 - b) Second year
 - c) Third year
2. Nurse
 - a) Diploma
 - b) Degree
 - c) Masters and above
6. Current working unit
 - a. Emergency room
 - b. Intensive care unit
 - c. Neurology ward
 - d. Wards other than neurology
7. Year of experienceyears
8. Average number of stroke patients seen per month-----
9. Have you had any training concerning acute care for stroke patients?
 - a. Yes
 - b. No

PART 2: questions pertaining to study objectives

A. Knowledge (Residents and general practitioner)

I- Please answer each of the following questions with True, False or I don't know (check ✓ on the chosen answer)

1. The time frame to define Early neurological deterioration in stroke patient is 72hours
 True False I don't know
2. A drop in GCS is not helpful parameter to assess early neurological deterioration in stroke patients.
 True False I don't know

KAP towards early neurologic deterioration in stroke among health professionals

3. Vital sign derangement is among the important parameters to assess early neurological deterioration in stroke patients.

True False I don't know

4. Persistent in-hospital hyperglycaemia during the first 24 hours after acute stroke is associated with worsened stroke outcome

True False I don't know

5. Elevated temperature doesn't increase the risk of ischemic injury in acute stroke

True False I don't know

6. Do you know about NIHSS (National Institutes of Health Stroke Scale)?

Yes No

7. If the answer to question number 6 is yes,

Which parameter can be used to assess early neurological deterioration?

An increase in NIHSS A decrease in NIHSS I don't know

8. Which electrolyte disturbance has significant association with stroke severity?

Dysnatremia Dyskalemia Dymagnesemia I don't know

All Participants

9. All patients with acute stroke have to be supplemented with IV fluid

True False I don't know

10. Fluid administration in acute stroke care depends on the measure of blood pressure

True False I don't know

11. Dysphagia is a major risk factor for developing aspiration pneumonia

True False I don't know

12. Electrolyte disturbance doesn't affect the level of consciousness

True False I don't know

13. The preferred choice of fluid to administer in acute care of stroke patients is

Normal saline lactated ringer Dextrose containing I don't know

Questions to assess Practice (All participants)

KAP towards early neurologic deterioration in stroke among health professionals

1. In your practice, do you measure the temperature of stroke patients in acute phase?

Yes No

2. If the answer to question 1 is yes

A. How frequent do you measure body temperature in febrile stroke patients?

Every 30mins for the first hours of ED stay then every 4hrs for 48hrs, twice per day thereafter

Once per day

Twice per day

Every 6hours

B. How frequent do you measure body temperature in afebrile stroke patients?

Every 30mins for the first hours of ED stay then every 4hrs for 48hrs, twice per day thereafter

Once per day

Twice per day

Every 6hours

3. When do you intervene for elevated temperature in acute stroke?

At Temp level of 38^oc and above

Temp level of 37^oc

At Temp level of 37.5^oc and above

4. Which method do you use to decrease elevated temperature?

Surface cooling

Antipyretics

Both

5. Do you administer IV fluid to all stroke

Yes No Maybe

If yes to question number 5

Which patients do you put on IV fluid?

KAP towards early neurologic deterioration in stroke among health professionals

- All stroke patients
- Haemorrhagic stroke if BP is low
- Patients with sub arachnoid haemorrhage
- Ischemic stroke patients

6. Do you assess stroke patient's fluid balance?

- Yes No

How often do you follow fluid balance?

- A. On daily basis
- B. Every 12hours
- C. If patient has low BP and on pressor support

7. Do you perform swallow test before initiating po feeding?

- Yes No

8. How frequent do you take serum glucose measurement?

- Once per day
- Twice per day
- Every 6hours
- Every 8hours
- Don't Practice

9. In your practice, when do you initiate DVT prophylaxis,

A. In ischemic stroke

- Within the first 24hours
- 48-72hours
- After 72hours of stroke onset

B. In hemorrhagic stroke

- Within the first 24hours
- 48-72hours

After 72hours of stroke onset

10. Have you ever put a stroke patient in acute care on oxygen?

Yes No

If the answer is yes, Which group of patients?

Those with oxygen saturation <90%

All stroke patients to keep oxygen saturation >94%

Those suspected to have Aspiration pneumonia irrespective of oxygen saturation level

11. How frequent do you send laboratory request to assess electrolyte abnormalities?

Every day

Every other day

Twice per day

As per needed

12. How often do you use neuro-sign chart to follow a stroke patient?

Always

Sometimes

Never

Questions to assess attitude (All participants)

1. Do you believe that causes for acute deterioration in stroke can be prevented?

Yes No Maybe

2. Do you think it is important to have swallow test for all patients with stroke before initiating Po feeding?

Yes No Maybe

3. Do you believe that all stroke patients should be supplemented with oxygen?

Yes No Maybe

4. What do you think is health care associated contributor for early neurological deterioration in stroke patients?

Underestimation of the seriousness of the disease

KAP towards early neurologic deterioration in stroke among health professionals

- Inadequate health education
- Inadequate equipment
- Delayed presentation of the patient

5. Whom do you think is responsible in detecting early neurological deterioration in stroke patients?

- Nurses Interns Residents Should be a team work

6. What do you believe contribute to improper use of neuro-sign chart

- Unavailability
- Underestimation of the need
- Lack of training how to use it
- I don't know

7. Do you believe that update lectures can improve quality of care given for stroke patients?

- Yes No Maybe

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