

Factors Affecting Nursing Performance in Caring Patients with Cerebral Stroke during First Golden Hours

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ABSTRACT

Context: Stroke is associated with high mortality, morbidity and creates a significant and enduring impact on patients, their families, and the wider society.

Aim: assess the nurses' performance for patients with cerebral stroke during the first golden hours through assessing nurses' level of knowledge regarding cerebral stroke and their nursing management during first golden hours, assessing the level of nurses' practices for patients with cerebral stroke during the first golden hours and assess factors that affect nurses' performance in the management of patients with cerebral stroke during first golden hours.

Methods: A descriptive exploratory study design was used to achieve the aim of this study. The study recruited a convenient sample of 80 nurses. Data collected from Intensive Care Units at Ain Shams University and specialized hospitals affiliated with Ain Shams University in Egypt. Two tools were used for data collection: Nurses' self-administered questionnaire and nurses' performance observational checklist.

Results: This study revealed that 63.75% had an unsatisfactory level of knowledge, 68.8% had inadequate performance, and there were human and non-human resource factors, both affect negatively on nurses' performance in the management of patients with cerebral stroke.

Conclusion: The study concluded that there was an unsatisfactory score of nurses' knowledge and practice, and there were human and non-human resource factors that negatively affect nurse's performance. Based on these findings, the study recommended periodic education programs be developed for nurses about managing patients with cerebral stroke during the first golden hours, and prospectively follow-up studies are needed to develop and refine interventions.

Keywords: Stroke, nurses' performance, golden hours

1. Introduction

The cerebrovascular disorder is an umbrella term that refers to a functional abnormality of the central nervous system that occurs when the blood supply to the brain is disrupted. Suffering from cerebrovascular disorders affects a survivor's quality of life, personal, social, vocational, and physical, resulting in social stigmatizing for the individual, which might affect the individual in a negative way (Gillen, 2015).

Stroke, known as cerebrovascular accident, is the sudden development of injury to the brain caused by the disruption of blood flow, cause oxygen deprivation to the surrounding cells and result in the death or injury of brain tissue. Subgroups of stroke consist of brain infarctions, also called cerebral infarctions or ischemic strokes, intracerebral hemorrhages (ICH), and subarachnoid hemorrhages (SAH) (Norving, 2014).

Ischemic strokes make up approximately 80% of all strokes, while hemorrhagic strokes account for the remaining 20%. Although hemorrhagic strokes are less common, they result in a higher mortality rate. The lesion's location and the size and cause determine what kinds of symptoms the patient will experience. There is a

transient ischemic attack (TIA) that is not included in the definition, as the symptoms disappear less than 24 hours after the onset. However, the risk of stroke following TIA is as high as ten to twenty percent in the first three months (Pellico, 2013).

According to Von Sarnowski *et al.* (2013), variously non-modifiable and modifiable risk factors for stroke have been identified. The non-modifiable factors include age, gender, race, and geography. Modifiable risk factors include hypertension, diabetes mellitus, lipids, tobacco use, physical inactivity, and alcohol use.

On the other hand, warning signs of stroke may appear on the body because the brain is not receiving enough oxygen. F.A.S.T. is an easy way to remember how to recognize a stroke and what to do. Spot a stroke FAST. Face drooping. Arm weakness. Speech difficulty. Time to call. Other danger signs that may occur include double vision, drowsiness, and nausea or vomiting (National Stroke Association, 2016).

The golden hours refer to a period from the patient's admission to the Intensive Care Unit or stroke unit until the first two hours following an acute stroke. The risk of dying is highest in the early few hours. The national stroke association uses the term "brain attack," reflecting

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the urgency of appropriate treatment to improve patient outcomes (Ignatavicius & Workman, 2015).

New guidelines for the early management of cerebral stroke include the importance of establishing regional stroke systems of care (SSOC) that incorporate emergency medical transport to designated stroke centers and the use of telemedicine consultation and aeromedical transport to increase patient access and limit delays in stroke treatment. Six Nurse practitioners (NPs) are increasingly being used in roles that interface with the SSOC for cerebral stroke, including emergency identification, evaluation, transport, and hospital management (Bullock, Clark, & Malone, 2012).

2. Significance of the study

Stroke is a significant health problem in developing countries. The prevalence rate of stroke in Egyptian governorates was significantly higher than in other Arabic countries (Khedr et al., 2014). In Egypt, according to recent estimates, the overall prevalence rate of stroke is elevated, with a crude prevalence rate of 963/100 000 inhabitants (Abd-Allah & Moustafa, 2014). Improvement of stroke care in Egypt should be achieved through a multi and interdisciplinary approach, including public awareness, physicians' education, and a synergistic approach to stroke care with the Emergency Medical System to improve quality of life for stroke patients. So, this study will shed light on the efficiency of nursing performance during the golden hours of stroke patient care and factors affecting this performance.

3. Aim of the study

This study aimed to assess the nurses' performance for patients with cerebral stroke during the first golden hours through the following:

- Assess nurses' knowledge level regarding cerebral stroke and their nursing management during the first golden hours.
- Assess nurses' practice level for patients with cerebral stroke during the first golden hours.
- Assess factors that affect nurses' performance in managing patients with cerebral stroke during the first golden hours.

3.1. Operational definition

Golden hours for ischemic stroke

It is six hours to start from the beginning of the symptoms if the occlusion was in small cerebral arteries; in this case, the patient must take anti thrombolytic therapy, but if the occlusion was in the large cerebral artery, the patient should entre cerebral angiography.

Golden hours for hemorrhagic stroke

Start from beginning symptoms and extend to 24 hours until catching the cause.

4. Subjects & Methods

4.1. Research design

A descriptive exploratory design was used in carrying out the study.

4.2. Research setting

This study conducted at the Intensive Care Unit (ICU) at Ain Shams university hospitals in Egypt which were two types: Medical ICU & Surgical ICU, and Intensive Care Unit at the specialized hospital which affiliated to Ain Shams University Hospital which was two types: (A) ICU & Neurosurgery ICU.

The total ICU beds were 62 beds, 32 beds at Ain Shams University hospitals; 10 beds were out of service, and 30 beds at the specialized hospital affiliated to Ain Shams University hospital; 6 beds were out of service.

4.3. Subjects

A convenient sample of all available (80) nurses from both gender who recruited from the above setting. The data collected during (8 months) started from August 1, 2016, to March 31, 2017.

4.4. Tools for data collection

The study data collected through the following two tools:

4.4.1. Nurses Self-Administered Questionnaire

It was developed by the researcher based on a review of the relevant recent literature Hall (2007), Kerr (2012), Jauch (2015), Hassanin (2016).

The first part concerned with sociodemographic characteristics as age, gender, marital status, qualification, years of experience, and training courses.

The second part included an assessment of nurses' knowledge regarding cerebral stroke disorders. Using a test format consists of (15) MCQ questions with (15) marks, one mark for each correct response.

The third part encompassed assessing nurses' knowledge of nurses regarding caregiving to a patient with cerebral stroke during the first golden hours. Using a pre-test format consists of (8) MCQ questions with (8) marks, one mark for each correct response.

The fourth part comprised assessing nurse's knowledge regarding caregiving to a patient with ischemic cerebral stroke disorders. Using a pre-test format consists of (5) MCQ questions with (5) marks one mark for each correct response.

The fifth part involved an assessment of nurse's knowledge regarding hemorrhagic cerebral stroke disorders. Using a test format consists of (11) MCQ questions with (11) marks one mark for each correct response. The sixth part covered the assessment of factors that affect nurses' performance in the management of patients with cerebral stroke disorders, which was (14) questions about his/her opinion divided into parts one about factors related to work, and it was (10) questions and other about individual factors which were (4) questions.

Scoring system

The total score of the knowledge questionnaire was 39 marks. Each correct response gave one mark and zero for the incorrect answer; questions were in the form of multiple-choice questions (MCQ), true & false, and arranged according to the priority. More than or equal 85% regarded as the satisfactory level of knowledge, which was ≥ 33 marks, and less than 85% considered the unsatisfactory level of knowledge which was < 33 marks. The

scoring system for factors (part six) was tabulated into two tables, one for human factors: (4) true & false questions, and another table for non-human factors, which were (10) true & false questions. The factors scored according to the verdict of study nurses.

4.4.2. Nurses Performance Observational Checklists

It was adopted from *Lynn (2011)* and modified by the researcher to assess nurses' practice for patients with cerebral stroke during the first golden hours. It included the following:

- Skill 1 observational checklist for nurse's practices of primary assessment for a patient with cerebral stroke during the first golden hours. Total marks were (12) marks.
- Skill 2 observational checklist for nurse's practices of using Glasgow Coma scale for a patient with cerebral stroke during the first golden hours. Total marks in this checklist were (3) marks.
- Skill 3 observational checklist for nurse's practices in receiving a patient with acute ischemic stroke during the first golden hours. Total marks in this checklist were (28) marks.
- Skill 4 observational checklist for nurse's practices in receiving a patient with hemorrhagic stroke during the first golden hours. Total marks in this checklist were (41) marks.
- Skill 5 observational checklist for nurse's practices of secondary assessment of patients with cerebral stroke during the first golden hours. Total marks in this checklist were (27) marks.

Scoring system

The total score of practices was 111 marks, each correct step gave one mark, and the incorrect action has given zero. A total score equal to or more than 85% regarded as a satisfactory level of practice which was ≥ 94 marks, while less than 85% is considered an unsatisfactory level of practice which was < 94 marks.

4.5. Procedures

Approval was obtained from the hospital director of Ain Shams university hospital. A letter was issued to them from the faculty of nursing, Ain Shams University explaining the aim of the study to obtain permission for conducting this study.

The operational design includes a preparatory phase that provides for reviewing of related literature and theoretical knowledge of various aspects of the study. Content validity was done by a panel of five experts in a medical-Surgical nursing specialty. The experts reviewed the tools for clarity, relevance, comprehensiveness, and simplicity; minor modifications were done. Reliability of the study tools was done using the alpha Cronbach test; the results showed the reliability of the questionnaire was 0.74 and 0.79 for the observational checklist.

A pilot study was conducted to test the feasibility and applicability of the tools used in this study. It was carried out on eight nurses (10% of total study subjects). The subjects involved in the pilot study omitted from the study. Ethical consideration: The study's aim and procedures explained to the nurses at the beginning of data collection. They assured that the information collected would

be treated confidentially and used only for the research (verbal consent taken from the nurses). Participants were allowed to withdraw at any time without penalties.

A sample of 80 nurses attending the study setting from August 1, 2016, to March 31, 2017, was included in this study. The researcher used to go to ICUs two days/week, from 9 am to 7 pm. Time taken to fill the first tool (questionnaire) ranged from 20 – 30 minutes on an individual basis to be filled depending on the nurse's degree of understanding and response. On another hand, regarding the second tool (observational checklist), each nurse was followed by the researcher two days per week. It took time for nurses' work with the patient, which differs if the patient had a hemorrhagic or ischemic stroke.

4.6. Data analysis

The collected data were organized, tabulated, and statistically analyzed using the statistical package for social science (SPSS). The statistical analysis was done using percentage; chi-square (χ^2). The observed differences and associations considered as follow: Non-significant at $P > 0.05$ and significant at $P \leq 0.05$

5. Results

Table 1 shows the distribution of the study nurses according to their demographic characteristics. The results revealed that their mean was 33.75 ± 6.76 , in which 48.8% of the study nurses were within the age group 20- <30 years. As regards gender, 82.52% of them were females. As regards marital status, 41.2% of them were married.

About educational level, 45% of the study nurses had secondary school nursing diplomas. Also, 37.5% of the study nurses had experience at 1- <5 years. Regarding attending the training courses, 75% of the study nurses did not participate in any training courses.

Figure 1 displays that 63.75% of the study nurses had unsatisfactory total knowledge regarding cerebral stroke and nursing management during the first golden hours.

Figure 2 shows that (68.75%, 63.75%, 55%, 77.8%, and 51.25%) of study nurses had unsatisfactory practice regarding primary & Glasgow coma scale assessment, the nursing intervention of patient with ischemic & hemorrhagic stroke, and secondary assessment during the first golden hours respectively.

Figure 3 shows that 68.80% had poor practice regarding nursing management of patients with cerebral stroke during early golden hours.

Regarding human factors that affect nurses' performance, Table 2 indicates that 68.75% of the study nurses were not satisfied with their work and were not well communicated with their coworkers. 72.5% stated there was no good communication with supervisors and 73.75% reported frequent nurses' absenteeism.

Table 3 reveals that 100% of the study nurses stated low salary and an inadequate number of nursing staff regarding human factors that affect nurses' performance. 96.25% of them reported that there was no job description.

Table 4 reveals no statistically significant relationship between total nurses' knowledge and their demographic characteristics except their year of experience at p -value > 0.05 .

Table 5 reveals no statistically significant relationship between total nurses' practice and their demographic characteristics, in which p-value >0.05.

Table 6 reveals a statistically significant relationship between unsatisfactory nurses' knowledge and non-human factors as lack of competitive rewards ($\chi^2= 4.626$ at p-value <0.05).

Table 7 shows a statistically significant relationship between unsatisfactory nurses' practice and non-human

factors as lack of job description ($\chi^2=8.068$ at p-value <0.05).

Table 8 shows a weak positive statistically significant correlation between nurses' knowledge and their practice regarding nursing management of patients with cerebral stroke during the first golden hours ($r= 0.134$ at p-value >0.05).

Table (1): Frequency distribution of sociodemographic characters among the study group nurses (n. 80).

Demographic Data	No.	%
Age		
20 -<30 years	39	48.8
30 -<40 years	20	25
40 -<50 years	13	16.2
+50 years	8	10
Mean±SD	33.75±6.76	
Gender		
Male	14	17.5
Female	66	82.5
Marital status		
Single	32	40
Married	33	41.2
Divorced	11	13.8
Widow	4	5
Educational level		
Diploma nursing school	36	45
Technical Institute of Nursing	29	36.3
Bachelor's degree in nursing	12	15
Postgraduate studies of nursing	3	3.8
Experience in years		
1-<5 years	30	37.5
5-<10 years	24	30
10-<15 years	14	17.5
+15 years	12	15
Training courses		
No	60	75
Yes	20	25

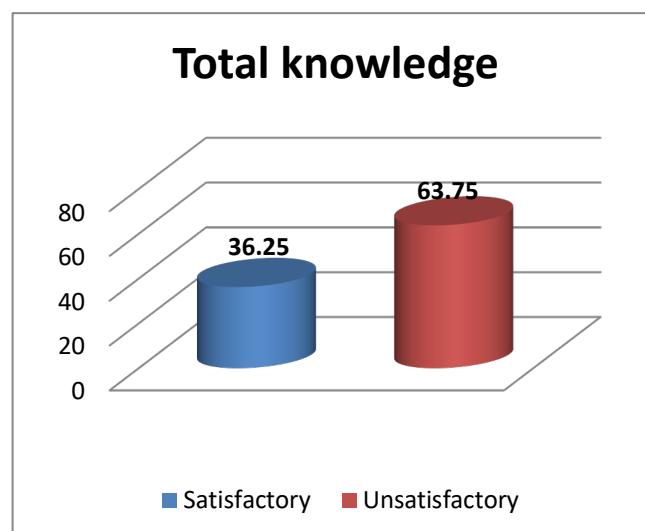


Figure (1): Percentage distribution of nurses' knowledge regarding cerebral stroke and nursing management during the first golden hours (n. 80).

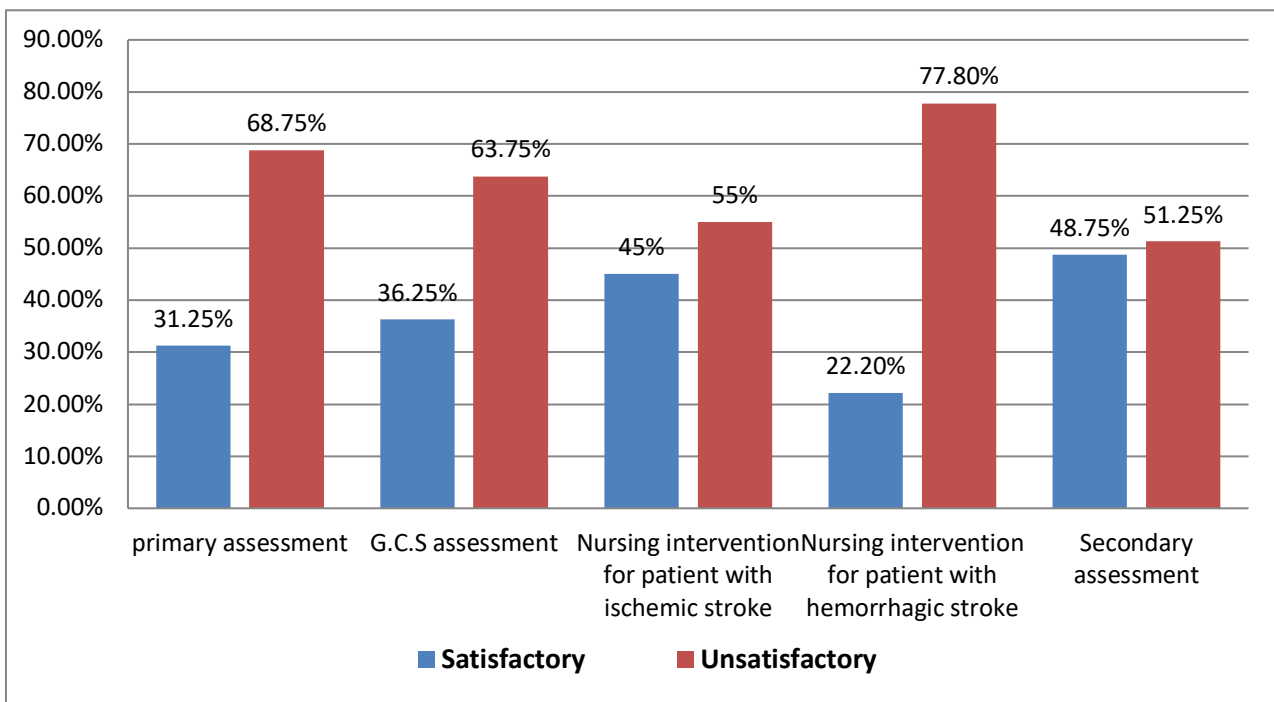


Figure (2): Percentage distribution of nurses' performance regarding caring of stroke patients during the golden hours (no. 80).

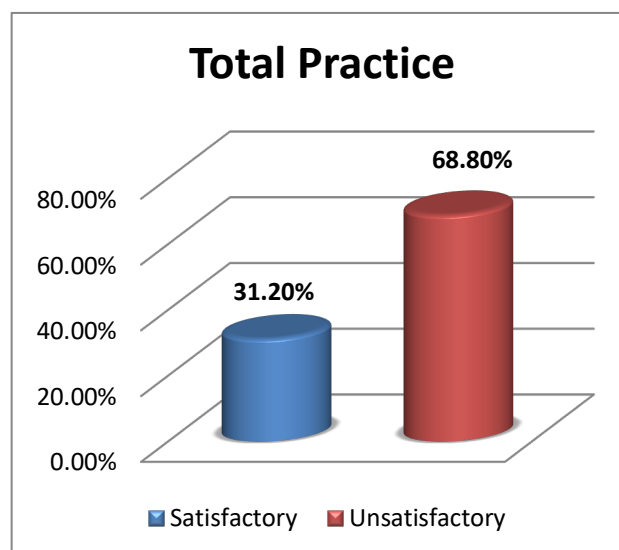


Figure (3): Percentage distribution of nurses' total practice in caring for the stroke patients' during first golden hours (n. 80).

Table (2): Frequency and percentage distribution of human factors affect nurses' performance according to the verdict of study nurses (n=80).

Human factors	Number and frequency distribution			
	Yes		No	
	No.	%	No.	%
Nurses' satisfaction with work	25	31.25	55	68.75
Frequent nurses' absenteeism	59	73.75	21	26.25
Communication with supervisors	22	27.5	58	72.5
Communication with coworkers	25	31.25	55	68.75

Table (3): Frequency and percentage distribution of non-human factors affect nurses' performance according to the verdict of study nurses (n=80).

Non-human factors	Yes		No	
	No.	%	No	%
Availability of competitive rewards	8	10	72	90
Availability of continues training	6	7.5	74	92.5
Availability of administration support	11	13.75	69	86.25
Availability of job flexibility	20	25	60	75
Availability of proper equipment	35	43.75	45	56.25
Availability of opportunities for creativity	16	20	64	80
Adequate salary	0	0	80	100
An adequate number of nursing staff	0	0	80	100
High workload	80	100	0	0
Availability of job description	3	3.75	77	96.25

Table (4): The relationship between total nurses' knowledge score and their sociodemographic characteristics (n=80).

Demographic characteristics	Total nurses' knowledge				X ²	P-value
	Satisfied (n=29)		Unsatisfied (n=51)			
	No	%	No	%		
Age						
20- <30 years	11	37.9	28	54.9	2.312	0.510
30- <40 years	9	31.0	11	21.6		
40 - <50 years	6	20.7	7	13.7		
≥50 years	3	10.3	5	9.8		
Gender					0.433	0.511
Male	4	13.8	10	19.6		
Female	25	86.2	41	80.4		
Marital status					3.917	0.271
Single	11	37.9	21	41.2		
Married	12	41.4	21	41.2		
Divorced	6	20.7	5	9.8		
Widow	0	0.0	4	7.8		
Educational level					4.580	0.205
Nursing diploma	16	55.2	20	39.2		
Nursing technical institute	9	31.0	20	39.2		
Nursing bachelor	2	6.9	10	19.6		
Nursing post-graduated	2	6.9	1	2.0		
Experience Years					7.070	0.048
1 <5 years	6	20.7	24	47.1		
5 <10 years	9	31.0	15	29.4		
10 <15 years	8	27.6	6	11.8		
+15 years	6	20.7	6	11.8		
Training courses					1.460	0.227
No	24	82.8	36	70.6		
Yes	5	17.2	15	29.4		

6. Discussion

Nurses' current roles working with stroke patients are multifaceted, diverse, and expanding; many require specialist skills. Essential caregiving skills and relationship-centered care must not be devalued – management of acute stroke patients organized around several priorities to ensure optimal patient outcomes (Williams, Perry, and Watkins, 2010).

Regarding the study nurse's characteristics, the present study results reveal that about half of the study nurses' age was less than thirty years old. This finding explains that most of those nurses were newly graduated. This finding was consistent with what was reported by Maarouf (2012), who stated that most of the study nurses were less than thirty years old.

The present study shows that more than three-quarters of the study nurses were females. This finding might be due to studying the nurses in Egyptian universi-

ties exclusive for girls only till a few years ago. These findings were consistent with Abd El Motelab (2014), who found that most of the nurses under study were females.

Regarding educational level, the present study results indicate that about half of the study nurses had a diploma in nursing schools. This finding might elaborate on the current condition of nursing qualification. This finding is consistent with what was reported by Maarouf (2012), who found that more than half of the study nurses had diploma nursing.

Concerning total nurses' knowledge regarding cerebral stroke and nursing management, the current study results show that more than half of study nurses had inadequate knowledge regarding cerebral stroke and nursing management during the first golden hours. This inadequacy of nurses' knowledge at this critical stage might be because of not attending a continuous educational program. These results are consistent with Mohammed

Table (5): The relationship between total nurses' practice score and their sociodemographic characteristics (n=80).

Demographic characteristics	Total nurses' practice				X ²	p-value
	Satisfactory (n=25)		Unsatisfactory (n=55)			
	No.	%	No.	%		
Age						
20- <30 years	13	52.0	26	47.3	0.903	0.825
30- <40 years	5	20.0	15	27.3		
40 - <50 years	5	20.0	8	14.5		
≥50 years	2	8.0	6	10.9		
Gender					0.057	0.812
Male	4	16.0	10	18.2		
Female	21	84.0	45	81.8		
Marital status					2.499	0.475
Single	13	52.0	19	34.5		
Married	9	36.0	24	43.6		
Divorced	2	8.0	9	16.4		
Widow	1	4.0	3	5.5		
Educational level					1.965	0.580
Nursing diploma	13	52.0	23	41.8		
Nursing technical institute	8	32.0	21	38.2		
Nursing bachelor	4	16.0	8	14.5		
Nursing postgraduate studies	0	0.0	3	5.5		
Experience Years					0.374	0.946
1- <5 years	10	40.0	20	36.4		
5- <10 years	8	32.0	16	29.1		
10 - <15 years	4	16.0	10	18.2		
≥15 years	3	12.0	9	16.4		
Training courses					0.175	0.676
No	18	72.0	42	76.4		
Yes	7	28.0	13	23.6		

Table (6): The relationship between total nurses' knowledge score and non-human resources factors (n=80).

Non-human Resources factors	Total nurses' knowledge				X ²	p-value
	Satisfactory		Unsatisfactory			
	No.	%	No.	%		
Availability of competitive rewards					4.626	0.031
Yes	1	1.25	16	20		
No	20	25	43	53.75		
Availability of continues training					3.637	0.056
Yes	2	2.5	18	22.5		
No	19	23.75	41	51.25		
Availability of administration support					0.088	0.767
Yes	5	6.25	16	20		
No	16	20	43	53.75		
Availability of job flexibility					0.621	0.431
Yes	8	10	17	21.25		
No	13	16.25	42	52.5		
Availability of proper equipment					0.079	0.779
Yes	10	12.5	26	32.5		
No	11	13.75	33	41.25		
Availability of opportunities for creativity					0.117	0.732
Yes	8	10	25	31.25		
No	13	16.25	34	42.5		
Adequate salary					2.340	0.126
Yes	2	2.5	15	18.75		
No	19	23.75	44	55		
Adequate number of nursing staff					0.088	0.767
Yes	5	6.25	16	20		
No	16	20	43	53.75		
High workload					0.194	0.660
Yes	15	18.75	45	56.25		
No	6	7.5	14	17.5		
Availability of job description					0.015	0.904
Yes	10	12.5	29	36.25		
No	11	13.75	30	37.5		

Table (7): The relationship between total nurses' practice score and non-human resources factors (n=80).

Non-human resources factors	Total nurses' practice				X ²	P-value
	Satisfactory		Unsatisfactory			
	No.	%	No.	%		
Availability of competitive rewards						
Yes	1	1.25	16	20	2.018	0.155
No	13	16.25	50	62.5		
Availability of continues training						
Yes	3	3.75	17	21.25	0.115	0.734
No	11	13.75	49	61.25		
Availability of administration support						
Yes	2	2.5	19	23.75	1.255	0.263
No	12	15	47	58.75		
Availability of job flexibility						
Yes	4	5	21	26.25	0.057	0.812
No	10	12.5	45	56.25		
Availability of proper equipment						
Yes	6	7.5	30	37.5	0.031	0.859
No	8	16	36	45		
Availability of opportunities for creativity						
Yes	6	7.5	27	33.75	0.018	0.893
No	8	16	39	48.75		
Adequate salary						
Yes	2	2.5	15	18.75	0.492	0.483
No	12	15	51	63.75		
Adequate number of nursing staff						
Yes	1	1.25	20	25	3.200	0.074
No	13	16.25	46	57.5		
High workload						
Yes	11	13.75	49	61.25	0.115	0.734
No	3	3.75	17	21.25		
Availability of job description						
Yes	2	2.5	37	46.25	8.068	0.005
No	12	15	29	36.25		

Table (8): The relationship between total nurses' knowledge and practice.

Variables	Total Practice	
	Correlation	P-value
Total Knowledge	0.134	0.332

(2015), who found that more than three-quarters of nurses' study had inadequate knowledge.

About elements of primary assessment, the current study shows that most of the nurses' study had poor practice regarding airway, breathing, circulation, disability, and exposure assessment for patients with cerebral stroke during the first golden hours. This result reflects the nurses' neglecting of the most critical part of nursing care through which the nurses provide life-saving measures. This result could be attributed to a lack of job description, treatment protocols, motivation, interest, and a shortage of nursing staff, leading to work overload.

This result is consistent with *Ewais (2011)*, who stated that most nurses had low practice scores concerning assessing the patient for signs and symptoms of airway obstruction.

Regarding human factors that affect nurses' performance, the current study shows that most study nurses had no satisfaction with their work. Also, most of them stated there were frequent nurses' absenteeism and poor communication with supervisors and coworkers. This result contraindicated with *Mekhimer (2016)*, who found that there was high job satisfaction.

Regarding non-human factors affecting nurses' performance, the current study shows that all the study nurses stated did not take an adequate salary, and there is no adequate number of nursing staff, and there was no availability of job description. This result goes on the same line with *Maarouf (2012)*, who found that most of the study nurses have not taken an adequate salary and a nursing staff shortage. Also, this result is supported by *Delucia, Ott, and Palmieri (2009)*, who found in his study that nurses in the

emergency unit were overloaded with the number of patients and the number of hours they work, and there was a lack of training and insufficient support from management.

7. Conclusion

In light of the current study results, it can conclude that two-thirds of the study sample had an unsatisfactory level of knowledge regarding cerebral stroke, more than two-thirds of them had an unsatisfactory level of practice regarding nursing management for patients with cerebral stroke during the first golden hours. Moreover, there were human and non-human factors, both of which affect nurses' performance.

8. Recommendation

- Emphasizing the importance of more studies to shed light on the factors that hinder nursing performance and overcome them.
- Periodic education programs for nurses about the care giving to patients with cerebral stroke to improve their performance.
- Further studies to be carried out in different settings on a larger sample to achieve generalization of the results.

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