

Nurses Knowledge and Practice Regarding Care of Comatose Children at Pediatric Intensive Care Units

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Abstract

Background: Coma is a state of prolonged unconsciousness in which the patient cannot be aroused even with painful stimuli. Coma in children is categorized into traumatic and non-traumatic (NTC). **Aim of the study:** was to assess nurses' knowledge and practice regarding care of comatose children at pediatric intensive care units. **Subjects & Method: Research design:** A descriptive design was used. **Setting:** The study was conducted at Pediatric intensive care unit in Pediatric hospital at Zagazig University Hospitals, Pediatric intensive care unit at Al Ahrar Hospital and Pediatric intensive care unit at General Hospital. **Subjects:** The study sample included all accessible nurses who work at the previous setting. **Tools of data collection:** Two tools were used to collect the necessary data. **The first** was a structured interview questionnaire. **The second** was observational checklist for nurses' practice. **Results: The study results** revealed that the total scores of nurses' knowledge were good, fair and poor with percentage 69.2, % 27.7% and 3.1% respectively while the total practices level of all studied nurses were unsatisfactory. **Conclusion:** The study concluded that more than two third of studied nurses had good knowledge regarding care of comatose children while all studied nurses' practice provided to comatose children was unsatisfactory. Therefore, the expected care provided to comatose children was unsatisfactory. **Recommendations:** The study recommended that continuous formal training programs about care of comatose children will help nurses to update their knowledge and improve their practice was recommended.

Key words: Pediatric, Comatose, Knowledge, Practice.

Introduction:

Consciousness is the ability to respond to sensory stimuli and have subjective experiences.

Unconsciousness is inability to respond to sensory stimuli and have subjective experiences. Coma is defined as a state of prolonged unconsciousness in which the child can't be aroused even with painful stimuli ⁽¹⁾ as well as coma is an alteration of consciousness that represents the final pathway of various pathophysiological processes in disease states (trauma, neoplastic and seizures). Ultimately leading to derangement in cerebral function manifested as decreased arousal and awareness ⁽²⁾.

Loss of consciousness can be brief lasting for a few seconds to minutes or

sustained, lasting for an hour or longer and often experience decreased quality of life ⁽³⁾.

Numerous causes of coma can be divided into traumatic and non-traumatic categories ⁽⁴⁾.

Coma caused by infectious disease accounted for 66.7% of children, poisoning, diabetes and epilepsy, only accounting for 1.4%, 1.1%, and 2.2% respectively ⁽⁵⁾.

Non traumatic coma (NTC) usually happens greater in younger than in older children and the most common causes of NTC are infections, toxins, status epileptic's. As well as cardiac or brain abnormalities, hypoxia or ischemia and metabolic disorders ⁽⁶⁾.

Prognosis of coma depends principally on its causes, duration of coma and age of children are

important prognostic factors to children younger than 2 years old have a very poor prognosis. Lack of response to painful stimuli for 3 days indicates poor prognosis with sensitivity of 70-100%⁽⁷⁾.

The initial treatment of these children is generally supportive till the etiology is specified. The first objective is to minimize impaired brain perfusion that is achieved by proper oxygenation, fluid and electrolyte administration and monitoring vital signs. Following stabilizing the vital signs, medications with potential toxicity should be discontinued⁽⁶⁾.

pediatric nurses plays a vital role in intensive care units through help children examine their life style, recognize risks and potential areas for change, advice on a focused individualized plan and facilitate the accomplishment of their goals⁽⁸⁾.

Significance of the Study:

Coma is a common cause of morbidity and mortality in children. Non traumatic coma (NTC) is a common problem in pediatric practice accounting for 10-15% of all hospital admissions it makes a heavy demand on intensive care units. Because the comatose children are totally dependent on the nurse for supporting and maintaining of all basic functions to meet their actual and potential needs. As well as prevention of complication. The neurological assessment is a key component in the care of the neurological child. It can help the nurses to detect the presence of neurological disease or injury and monitor its progression, determine the type of care and gauge the children response to intervention. Therefore, this study will be conducted to assess nurse's knowledge and practice as well as determine if they are have sufficient knowledge and practice or not about care provided to comatose children.

This goal can't be done without well qualified thoroughly knowledgeable nurses, especially in critical care settings. Nurses should have efficient assessment and evaluation skills to deal and manage their patients particularly those with disturbed LOC through the application of pediatric Glasgow coma scale (GCS)⁽⁹⁾.

Rapid and correct assessment will minimize the neurological complications, unnecessary and incorrect diagnostic procedures, mortality and morbidity. The basic requirements for any assessment to be effective are the availability of an objective, valid, reliable and accurate tools. The first neurological tool used to assess child' level of consciousness is GCS⁽¹⁰⁾

Aim of the study:

The present study aimed to assess nurses' knowledge and practice regarding care of comatose children at pediatric intensive care units.

Research Questions:

- 1- What are the nurses level of knowledge regarding care of comatose children at pediatric intensive care units?
- 2- What are the nurses level of practice regarding care of comatose children at pediatric intensive care units?

Subjects and methods:

Research design:

A descriptive design was used.

Study setting:

The study was conducted at three setting:

- Pediatric intensive care unit at Pediatric Hospital at Zagazig University Hospitals.
- Pediatric intensive care unit at AL Ahrar Hospital.
- Pediatric intensive care unit at General hospital at Zagazig City.

Study subjects:

The subjects of this study composed of convenient sample of all accessible nurses who work at previous setting, agree to participate in the study, give direct care for comatose children and had more than 6 months experience.

Tools of data collection:

Two tools were used to collect the necessary data:

Tool I: A structured interview questionnaire

A structured interview questionnaire was developed by the researcher and consists of two parts:

- **Part A:** Characteristics of the studied nurses such as age, sex of nurses, education level, years of experiences, attended any training program.
- **Part B:** Nurses knowledge regarding care of comatose children including forty close ended questions, each correct answer was scored 1 point and zero for wrong one and the total score was 118 marks
- **Tool II: Observational Checklist for nurses**

Observational Checklist for nurses was developed by the researcher it include nursing practice about all aspect of care provided to comatose children and composed of twelve item ,each correct step done took one point and the total score of practice was 280 marks.

Content Validity and reliability:

For validity assurance purposes, tools were developed after a thorough review of the related literature and then submitted to a jury of three experts (Two professor of pediatric medicine at faculty of medicine, one professor of pediatric nursing at faculty of nursing. The recommended modifications were done and the final form was ready for use.

Reliability of tool was done by using cronbach's Alpha test reliability coefficient to measure the internal consistency for the final scales.

The reliability of structured interview questionnaire was 0.73. The reliability of observational checklist sheet was 0.83

Field work:

Data were collected within a period of six months from the beginning of august 2018 to end of January 2019. After getting the official permission the pilot testing of the study tools was done and analyzed. Nurses were met by the researcher 6 days per week from Saturday to Thursday from 10:00 a.m.to 1:00 p.m. for morning shift and from 2:00 p.m. to 5:00 p.m. for afternoon shift. The researcher interviewed the nurses individually according to their availability (after providing nursing activities of the unit).the purpose of the study was explained briefly to nurses and obtained their verbal consent..

Pilot study:

A pilot study was conducted on 10% of the nurses to assess the applicability of the data collection tools arrangements of items, estimate the time needed for each sheet and the feasibility of the study and acceptance to be involved in the study .Subjects who shared in the pilot study were included in the main study sample.

Administrative and ethical considerations:

All ethical issues were taken into consideration during all phases of the study:

The research approval was obtained from ethical committee before starting study. The researcher maintained an -anonymity and confidentiality of the subjects. The inclusion of subjects in the study was totally voluntary. The aim of this study was explained to every nurse before participation and an oral consent was obtained. Nurses

were notified that they can withdraw at any stage of the research; also they were assured that the information obtained during the study will be confidential and used for the research purpose only.

Statistical analysis:

Data collected throughout history, questionnaires and outcome measures coded, entered and analyzed using Microsoft Excel software. Data were then imported into Statistical Package for the social sciences (SPSS version 16.0) software for analysis. According to the type of data qualitative represent as number and percentage ,quantitative continues group represent by mean± SD, the chi square test (χ^2) was used to test differences for significance; difference and association of qualitative variable to find the significant association between the demographic and clinical data and the outcome measures. Cronbach alpha coefficient test was calculated to assess the reliability of the scales through their internal consistency. (Level of significance; P value was set at <0.05 for significant results &<0.01 for high significant result)

Results:

Table (1) shows the characteristics of the studied nurses. Regarding to age, it was found that 46.2% of the studied nurses in the age group from 20 to less than 25 years and 9.2% from 30-34 years old with mean age 24.97±2.94 years. It was revealed from the same table that 49.2% of the studied nurses had enough income and 43.1% their income is not enough. The same table also showed that 61.5% of the studied nurses had finished their education in technical institute of nursing while 27.7% had a bachelor degree of nursing. Also it was found that 73.8% of the studied nurses had 1 to less than 5 years of experience and 9.2% from 10 and more years of experience with mean of 3, 68±3,55 years of experience. The

same table also reported that 64.6% of the studied nurses had attended previous training program compared to 35.4% never attended any previous training program about coma. The same table portrayed that 76.9% of the studied nurses spent 6 hours with comatose child per day compared to 23.1% spent 12 hours with comatose child per day.

Table (2) represents Nurses' knowledge about coma was illustrated in. It was found that 92.3% of the studied nurses defined coma as a state of lack of awareness and no response of child to people and objects around him, while 67.7% defined it as a marked change in the degree of awareness of the child himself and the environment around him. Regarding to the cause of coma, it was revealed that 95.4%, 93.8%, 87.7% and 33.8% respectively of the studied nurses stated head and brain injuries, stroke due to lack of blood reaching brain cells, hypoxia in tissues and brain cells and disturbance of metabolism. Concerning to the degrees of unconsciousness, it was found that 84.6% of the studied nurses stated deep coma in which the child does not respond to any effects even painful stimuli and 76.9% stated sub-coma in which the child responds to the painful effects only such as the pin stick while 43.1% stated loss of counseling consciousness in which the child is in a coma but responds to talk with him and easy to excite with noise and sudden movement. Also it was revealed that, 21.5% of the studied nurses reported that 4-6 minutes of oxygen deprivation can cause permanent damage of brain while 21.5% don't know about permanent damage of brain cells from oxygen deprivation. When the studied nurses were asked about common complications of coma, 93.8% mentioned bed sores, 86.2% mentioned joint stiffness and muscle weakness and 67.7% mentioned deep venous thrombosis while 52.3%

of studied nurses reported Constipation.

Table (3) portrays Nurses' knowledge about Glasgow coma scale. It was found that 81.1% of the studied nurses reported degree of awareness as the most evaluation uses of the Glasgow coma scale, while 52.3% reported degree of perception. Regarding to the good degree of awareness of comatose children on the Glasgow coma scale, 44.6% of the studied nurses reported 15 degrees as the highest degree. Among studied nurses 43.1% didn't have knowledge about the bad degree of awareness of comatose children on the Glasgow coma scale. Only 15.3% stated that 3 degrees is considered a bad degree of awareness of comatose child on the Glasgow coma scale. When nurses were asked about the components of the Glasgow coma scale, examination of eye response and examination of motor response were represented by 66.2% for each and 60.0% reported the examination of the response to speech and talk with the child.

Table (4) portrays nurses' practice regarding maintain adequate ventilation of comatose children. It was found that 89.2% and 95.4% respectively of studied nurses assessed rate pattern of breathing and assessed child for cyanosis in assessment of respiratory system. While 92.3% and 96.9% respectively didn't assess lung sounds and occlusion of oropharynx by epiglottis or tongue. Concerning to maintain airway patency, it was found that 89.2%, 98.5% and 100.0% respectively of studied nurses placed child in semi prone or lateral position, elevated the head of the bed 30 degrees to prevent aspiration and kept mouth clean by suction. Meanwhile 98.5% didn't auscultate the chest to detect any adventitious breath sounds or absence of breath sounds. Regarding administration of

oxygen it was found that 98.5% regulated flow rate as the physician's order and check humidity of oxygen for each .Only 20.0% didn't check child's response to oxygen. The same table also showed that 87.7%, 93.8% and 100.0% respectively of studied nurses lubricated tip of catheter with a water-soluble lubricant, applied continuous suction as the catheter is withdrawn by using a twisting motion of the thumb and forefinger and recorded the making of oral and nasal pharyngeal suction. Only 20.0% didn't ensure hyper oxygenation and hyperventilation before and after suction to prevent hypoxia. On the other hand all studied nurses carried out chest physiotherapy and postural drainage to promote pulmonary hygiene unless contraindicated by the child' underlying condition.

Table (5) clarifies nurses' practice regarding maintain fluid balance and adequate nutrition of comatose children. It was found that 98.5%, 95.4% and 100.0% of studied nurses respectively administered fluid needs initially by giving the required fluids intravenously, administered intravenous solutions slowly to prevent increase intra cranial pressure and administered fluid diet in the form of juice, shake, soup, porridge, water via feeding tube. Only 47.7% of studied nurses assessed hydration status by examining skin turgor and mucous membranes. On the other hand 98.5% didn't assess nutritional status by measuring height, weight, lab tests and signs of malnutrition.

Table (6) Clarifies nurses practice about making eye care of comatose children. It was found that 96.9%, 100.0%, 86.2%, 93.8%, 89.2% and 98.5% of studied nurses respectively gathered needed equipment, cleaned lids if stack, wiped from inner to outer canthus with cotton ball, instilled artificial tears as prescribed every 2 hours,

rinsed and returned equipment as well as charted eye cleaning. Only 7.7% placed rubber sheet and towel to protect child and the bed when make eye care. On the other hand 86.2% didn't position child' head turned to one side as well as all nurses didn't place kidney basin against child' check. Also it was found that all of studied nurses protected child' eyes with an eye shield to prevent corneal ulceration and 96.9% applied eye patches when indicated to ensures that eyes remain closed under patch. Only 7.7% inspected the condition of eyes with a flash light at regular intervals to detect corneal irritation at earliest stage.

Table (7) shows the total knowledge score of the studied nurses. It was revealed that 69.2 % had good knowledge and 27.7% had fair knowledge, while 3.1% of the studied nurses had poor knowledge. The difference was statistically significant (**p value<0.01**).

Table (8) portrays relationship between average total practice score of the studied nurses and their socio demographic characteristics. It was found that there was no statistically significant relation between average total practice score of the studied nurses and their socio demographic characteristics

Discussion:

As regard to nurses' characteristics, the present study revealed that slightly less than one half of the studied nurses aged from 20 to less than 25 years old and the minority aged from 30-34 years old. This result matched with Ali (11) who found nearly the same result. Similarly with Khudhair (12) who carried out a study about Nurse's practice concerning mouth care for unconscious or debilitated patient and reported that the minority of nurses in the age group(30-34 years).this might

be due to oldest nurses goes to take administrative duties and always busy with it.

The result of the current study showed that the more than one half of studied nurses had finished their education in technical institute of nursing and more than one quarter had bachelor degree of nursing while the minority had diploma degree.it was agreed with Younis& Ahmed(13) who carried out a study about Physical Restraint and Maintenance of critically ill patient's safety in Intensive Care Unit: Effect of Clinical practice guidelines on nurse's practice and attitude and found nearly the same result.

As well as Alghamdi et al.,(14) who carried study about Assessment of Intensive Care Nurse Knowledge and Perception of Eye Care Practice for Unconscious and Mechanically Ventilated Patients in Intensive Care Units in Saudi Arabia and found that the minority of nurses had diploma degree. This might be due to closure of secondary nursing schools and employee nurses who only graduated from technical institute of nursing and faculty of nursing.

The results of the present study showed that more than two third of studied nurses had 1to less than 5 years of experience while the minority of nurses had from 10 and more years of experience. This result was matched with Ehwarieme &Anarado (15) who carried out a study about Nurses' Knowledge of Glasgow Coma Scale in Neurological Assessment of Patients in a Selected Tertiary Hospital Inedo State, Nigeria and found nearly the same result. Similarly with Güler et al., (16) who conducted a study about Intensive Care Nurses' Views and Practices for Eye Care and found that the minority of nurses had from 10 and more years of experience. This shortage of the nurses who had more experience years might be due to this

nurse goes to take administrative duties always busy with it.

The results of the present study showed that less than two third of studied nurses had previous training courses while more than one third of nurses didn't had any previous training courses. This result in contrast with Shalaby et al., (17) who carried out a study about Assessing the caring behaviors of critical care nurses and found that less than two third of studied nurses didn't had any previous training courses while more than one third of nurses had previous training courses. This might be due to continuous work in intensive care unit didn't provide nurses time to take more training program or due to lack of training program inside intensive care units.

The current study revealed that the great majority of the studied nurses were defined coma as a state of lack of awareness and no response of child to people and objects around him. This finding was supported by Singh et al., (18) who carried out a study about Attitude and perceptions about ICU care among primary caregivers of neurology ICU patients. And found nearly the same result.

When the studied nurses were asked about causes of coma in children, the majority of nurses mentioned head and brain injuries as well as stroke and more than three quarter of nurses mentioned overdose of medications. This finding was agreed with Ali (19) who carried out a study about Assessment of Nurses Knowledge Regarding Care of Unconscious Patients in El-mak Nimer University Hospital and found nearly the same result. This might be due to most children at high risk for accidents and poisoning from swallowing over dose of medication and other substance.

The result of the current study found that majority of the studied nurses mentioned that bed sores and Deep Venous Thrombosis (DVT) as a

common complications of coma This finding was in contrast with Mersal (20) who carried out a study about caregivers' knowledge and practice regarding prevention of immobilization complications in El-demerdash Hospital Cairo Egypt and reported that two third of nurses mentioned unsatisfactory knowledge about pressure ulcer and DVT. This might be due to lack of nurses knowledge about importance of maintain child mobility and promote body exercise for comatose children as well as the majority of nurses was graduated from technical institute of nursing so they didn't have the subject in their curriculum.

The result of the current study clarified that the minority of the studied nurses stated that damage of brain cells occurred after oxygen deprivation from 4 to 6 minutes. This results was not in harmony with Vural et al, (21) who carried out a study about Cardiopulmonary Resuscitation Knowledge among Nursing Students: a Questionnaire Study and found that two third of nursing students stated that brain may sustain damage after blood flow had been stopped for about 4 minutes, irreversible damage after about 7 minutes and if blood flow ceases for > 10 hrs., virtually all cells of the body die. This might be due to the difference between the two studied samples and this might be due to lack of nurses knowledge about duration in which brain cells damaged occurred after oxygen deprivation.

when the studied nurses were asked about Glasgow Coma Scale(GCS), more than three quarter of studied nurses answered correctly what the GCS used to evaluate, nearly two third of nurses knew the component of GCS. This finding disagree with Singh et al., (22) who carried out a study about Assessing Nurses Knowledge of Glasgow Coma Scale in Emergency and Outpatient Department and found that the majority of nurses who participated known what Glasgow Coma Scale devised to,

answered correctly the components of the Glasgow Coma Scale and knew what is the lowest score of the Glasgow Coma Scale. This might be due to nurses had studied about GCS in their previous curriculum.

Concerning nurses practice about suction, the result of the current study found that more than one half of studied nurses washed their hands before suction and two third of nurses inserted suction catheter gently to the level of the posterior pharynx and upper trachea, while more than three quarter of nurses (washed their hands after complete suction technique as and ensured hyper oxygenation and hyperventilation before and after suction). This study goes in line with Abdelazeem et al., (23) who carried out a study about Effect of Training Program on Nurses Knowledge and Competence Regarding Endotracheal Tube and Tracheostomy Care in Mechanically Ventilated Patients and found nearly the same result.

On the other hand this finding disagree with Jansson et al., (24) who carried out a study about Evaluation of endotracheal suctioning practices of critical care nurses An observational correlation study and found that more than one half of nurses ensured pre suctioning hyper oxygenation and less than three quarter of nurses disinfected their hands prior to suctioning while more than one half of nurses disinfected their hands post suctioning. This might be due to nurses follow aseptic technique and protect children from hypoxia during suction.

Newstead et al., (25) who carried out study about Australian critical care nursing professionals' attitudes towards the use of traditional chest physiotherapy techniques reported that the majority of nurses performed chest physiotherapy techniques in clinical practice. This was in accordance with the finding of the current study, were all nurses carried out chest physiotherapy and postural

drainage to promote pulmonary hygiene, unless contraindicated by the child' underlying condition. This might be due to nurses had sufficient training on making chest physiotherapy for comatose children.

The result of the current study showed that the majority of studied nurses monitor fluid intake and output carefully, administered fluid needs initially by giving the required fluids intravenously, while less than one half of nurses assessed hydration status by examining skin turgor and mucous membranes regarding maintain fluid balance and adequate nutrition of comatose children. This findings were disagreement with Leilah et al., (26) who conducted a study about Developing Nursing Standards for Maintaining Fluid and Electrolyte Balance for Critically Ill Patients in Intensive Care Units and found that more than one third of nurses completely measured of fluid intake and output/hour accurately and the minority of nurses completely assessed skin turgor, color and mucus membrane. This might be due to nurses follow instruction in providing child fluids but not have good practice on assessing child hydration status.

The results of the current study revealed that more than one half of nurses washed their hands before eye care, all nurses (cleaned child eye with cotton balls moistened with sterile normal saline and installed prescribed ophthalmic ointment in each eye and cover it) while less than three quarter assessed signs of impaired corneal integrity e.g. drying, irritation, ulceration and look for presence of corneal blink response. This results in contrast with Milutinović et al.,(27) who carried out a study about Eye Care In Mechanically Ventilated Critically Ill Adults –Nursing Practice Analysis and found that most nurses always washed their hands before and after procedures, more than one quarter always cleaned the eyes by using normal saline or sterile water every two hours and less than one quarter always administered

appropriate eye ointment every four hours while less than one half always used adhesive tape for closing patient's eyes appropriately. This might be due to nurses follow recommended instructions on eye care but some nurses ignore the importance of assessed child' eyes for signs of impaired corneal integrity.

There was no statistically significant relation between nurses' characteristic and their practice. This result was goes in line with Kaya & and Dogu (28) who carried out a study about Intensive Care Unit Nurses' Knowledge, Attitudes and Practices Related to Using Physical Restraints and found nearly the same result. This result might be due to nurses' characteristic not affected on nurses' practice.

Conclusion:

Based upon the findings of the present study, it can be concluded that more than two third of studied nurses had good knowledge regarding care of comatose children while all studied nurses' practice provided to comatose children was unsatisfactory. Therefore, the expected care provided to comatose children was unsatisfactory.

Recommendations:

In the light of the findings of the current study, the following recommendations are suggested:

- Continuous formal training programs about care of comatose children will help nurses to update their knowledge and improve their practice
- A provision of periodic workshops and seminars for Pediatric Intensive Care Units (PICUs) nurses about care of comatose children.
- A designed protocol about coma and coma care should be provided to all PICUs nurses
- The head nurse should provide adequate guidance, supervision and regular feedback to improve staff nurses' performance .

Table 1: Characteristics of the studied nurses (n=65)

Characteristics	No	%
Age/years		
• 20-	30	46.2
• 25-	29	44.6
• 30-34	6	9.2
Mean± SD = 24.97 ± 2.94 years		
Gender		
• Females	65	100.0
• Males	0	00.0
Social Status		
• Married	46	70.8
• Single	19	29.2
Income		
• Enough & save	5	7.7
• Enough	32	49.2
• Not enough	28	43.1
Education		
• Diploma	7	10.8
• Institute	40	61.5
• Bachelor	18	27.7
Experience years		
• 1-	48	73.8
• 5-	11	17
• 10+	6	9.2
Mean± SD = 3.68 ± 3.55		
Experience years in Pediatric ICU		
• 1-	55	84.6
• 5-	7	10.8
• 10+	3	4.6
Mean± SD = 2.71 ± 2.80		
Training Courses		
• Yes	42	64.6
• No	23	35.4
Number of training courses		
• 0	23	35.4
• 1	24	37
• 2	9	13.8
• 3	6	9.2
• 4	3	4.6
Time spent with comatose child/day		
• 6 hours	50	76.9
• 12 hours	15	23.1

Table (2): Nurses' knowledge about coma

Items	No	%
Definition of coma ♣		
• A state of lack of awareness and no response of child to people and objects around him	60	92.3
• A state of loss consciousness for long periods	57	87.7
• The inability of the child to respond to external events or meet his basic needs	52	80.0
• A marked change in the degree of awareness of child himself and the environment around him	44	67.7
• The state of the child's awareness of himself and the environment around him*	0.00	0.00
Mean ± SD = 3.28 ± 1.04		
Causes of coma ♣		
• Head and brain injuries.	62	95.4
• Stroke.	61	93.8
• Hypoxia in tissues and brain cells.	57	87.7
• Brain tumor.	56	86.2
• Sedations and alcohol.	54	83.1
• Overdose of medications.	53	81.5
• High or low blood glucose levels.	52	80.0
• Increase ammonia level due to renal and hepatic failure.	52	80.0
• Body infection such as meningitis.	50	76.9
• Epileptic fits and convulsions.	50	76.9
• Encephalitis.	45	69.2
• Poisoning.	43	66.2
• Congenital anomalies of brain and heart.	39	60.0
• Low or very high body temperature.	36	55.4
• Some psychological illnesses such as anxiety and severe psychological conflict.	29	44.6
• Disturbance of metabolism	22	33.8
• Hypercholesterolemia*	0	00.0
Mean ± SD = 11.71 ± 3.49		
degrees of unconsciousness ♣		
• Deep coma in which the child does not respond to any effects even painful stimuli	55	84.6
• Sub-coma in which the child responds to the painful effects only such as pin stick	50	76.9
• Loss of counseling consciousness in which the child is in a coma but responds to talk with him and easy to excite with noise and sudden movement	28	43.1
• Loss of changing consciousness in which the child* responds for a short period and then loses	0	0.00
• Don't know	2	3.1
Mean ± SD = 2.05 ± 0.74		
Permanent damage of brain cells due to oxygen deprivation occur:		
• 4-6 minutes.	14	21.5
• From 20-40 seconds.*	0	0.00
• 1-2 minutes.*	0	0.00
• From 2-4 minutes.*	0	0.00
• Don't know	14	21.5
Mean ± SD = 0.22 ± 0.41		

Continue table (2)

Common complications of coma♣		
• Bed sores.	61	93.8
• Joint stiffness and muscle weakness.	56	86.2
• Respiratory pneumonia.	50	76.9
• Deep venous thrombosis.	44	67.7
• Blood poisoning*	0	0.00
• Constipation.	34	52.3
• Don't know	0	00.0

Table 3: Nurses' Knowledge about Glasgow Coma Scale

Items	No	%
The Glasgow coma scale is used to evaluate ♣		
• Degree of Awareness	53	81.5
• Degree of Perception	34	52.3
• Mental changes*	0	00.0
• Mood changes*	0	00.0
• Don't know	12	18.5
Mean ± SD = 1.34 ± 0.77		
The good degree of awareness of the comatose child on Glasgow coma scale is		
• 15 degrees	29	44.6
• 10 degrees*	0	00.0
• 8 degrees*	0	00.0
• 4 degrees*	0	00.0
• Don't know	28	43.1
Mean ± SD = 0.45 ± 0.50		
The bad degree of awareness of the comatose child on Glasgow coma scale is		
• Don't know	28	43.1
• 3 degrees	10	15.3
• 2 degrees	0	00.0
• 1 degrees	0	00.0
• 4 degrees	0	00.0
Mean ± SD = 0.15 ± 0.36		
Glasgow coma scale include♣		
• Examination of eye response	43	66.2
• Examination of motor response	43	66.2
• Examination of the response to speech and talk with the child	39	60.0
• Examination of the psychological status of the child*	0	00.0
• Don't know	19	29.2
Mean ± SD = 1.92 ± 1.38		

♣More than one answer

*Wrong answer

Table 4: Nurses' practice regarding maintain adequate ventilation of comatose children

Maintain adequate ventilation	Done		Not done	
	No	%	No	%
A) Assess respiratory system				
1- Rate pattern	58	89.2	7	10.8
2- Lung sounds	5	7.7	60	92.3
3- Lung expansion	15	23.1	50	76.9
4- Signs of tissue hypoxia	39	60	26	40.0
5- Aspiration of vomitus or oral secretions	44	67.7	21	32.3
6- Presence of airway secretions	50	76.9	15	23.1
7- Occlusion of oropharynx by epiglottis or tongue	2	3.1	63	96.9
8- Cyanosis	62	95.4	3	4.6
9- Pallor	49	75.4	16	24.6
Mean ± SD = 4.98 ± 1.28				
B) Maintain airway patency				
1-Place child in semi prone or lateral position	58	89.2	7	10.8
2-Elevate the head of the bed to 30 degrees to prevent aspiration	64	98.5	1	1.5
3-Prevent tongue to fall to the back by using airway or mouth gag	34	52.3	31	47.7
4-Keep mouth clean by suction	65	100.0	0	00.0
5-Auscultate the chest at least every 8 hours	1	1.5	64	98.5
Mean ± SD = 3.42 ± 0.56				
C)Administer oxygen				
1-Regulate flow rate as the physician's order	64	98.5	1	1.5
2-Check humidity of oxygen	64	98.5	1	1.5
3-Check child's response to oxygen	52	80.0	13	20.0
4-Record the activity on child' chart	62	95.4	3	4.6
Mean ± SD = 3.72 ± 0.48				
D)Oral and nasal pharyngeal suction:				
1-Wash hands	40	61.5	25	38.5
2-Ensure hyper oxygenation and hyperventilation before and after suction	52	80.0	13	20.0
3-Lubricate tip of catheter with a water-soluble lubricant	57	87.7	8	12.3
4-Insert gently to the level of the posterior pharynx and upper trachea	45	69.2	20	30.8
5-Apply continuous suction as the catheter is withdrawn by using a twisting motion of the thumb and forefinger	61	93.8	4	6.2
6-Hand washing	52	80.0	13	20.0
7-Recording	65	100.0	0	00.0
Mean ± SD = 5.72 ± 1.08				
E) Carry out chest physiotherapy and postural drainage to promote pulmonary hygiene, unless contraindicated by the child' underlying condition.				
Mean ± SD = 1.00 ± 0.0				

Table 5: Nurses' practice regarding maintain fluid balance and adequate nutrition of comatose children

Maintain fluid balance and adequate nutrition	Done		Not done	
	No	%	No	%
1-Assess nutritional status by measuring Ht-Wt, lab tests, signs of malnutrition	1	1.5	64	98.5
2-Assess hydration status by examining skin turgor and mucous membranes	31	47.7	34	52.3
3- Administer Fluid needs initially by giving the required fluids intravenously	64	98.5	1	1.5
4-Monitor fluid intake and output carefully.	64	98.5	1	1.5
5-Administer intravenous solutions slowly to prevent increase intra cranial pressure	62	95.4	3	4.6
6-Avoid over hydration to prevent cerebral edema	55	84.6	10	15.4
7- Administer fluid diet in the form of juice, shake, soup, porridge, water via feeding tube	65	100.0	0	00.0
8-Initiate TPN, if the child cannot tolerate Ryle tube feeding	24	36.9	41	63.1
9-Monitor nutritional parameters (Ht, Wt, clinical examinations) at regular intervals	19	29.2	46	70.8
Mean ± SD = 5.92 ± 1.15				

Table (6): Nurses practice about making eye care of comatose children

Eye care	Done		Not done	
	No	%	No	%
1-clean eye as the following				
1-Wash hands	37	56.9	28	43.1
2-Gather equipment	63	96.9	2	3.1
3-Assess signs of impaired corneal integrity (drying, irritation, ulceration) look for presence of corneal blink response	48	73.8	17	26.2
4-Position child with head to one side	9	13.8	56	86.2
5-Place rubber sheet and towel to protect child and bed	5	7.7	60	92.3
6-Place kidney basin against check	0	00.0	65	100.0
7-Clean eye with cotton balls moistened with sterile normal saline	65	100.0	0	00.0
8-Clean lids if stack	65	100.0	0	00.0
9-Wipe from inner to outer canthus with cotton ball	56	86.2	9	13.8
10-Gently separate eye lids	53	81.5	12	18.5
11-Instill artificial tears as prescribed every 2 hours.	61	93.8	4	6.2
12-Instill prescribed ophthalmic ointment in each eye and cover it	65	100.0	0	00.0
13-Rinse and return equipment	58	89.2	7	10.8
14-Chart	64	98.5	1	1.5
Mean ± SD = 9.98 ± 1.11				
2-Inspect the condition of eyes with a flash light at regular intervals to detect corneal irritation at earliest stage	5	7.7	60	92.3
3-Protect eyes with an eye shield to prevent corneal ulceration	65	100.0	0	00.0
4-Make sure that child' eye is not rubbing against any- thing such as bedding or child's own clothing	35	53.8	30	46.2
5-Apply eye patches when indicated	63	96.9	2	3.1

Table (7): Total nurses' knowledge score

Knowledge Level	Values	No	%	significance test	P
Poor knowledge	< 50.0%	2	3.1	$\chi^2=114.49$	<0.001 \$
Fair knowledge	50.0% - <75.0%	18	27.7	$\chi^2=25.88$	
Good knowledge	≥75.0%	45	69.2	$\chi^2=19.23$	

(\$) P value is statistically significant at <0.001

Table (8): Relation between average total practice score of the studied nurses and their socio demographic characteristics

Characters	No	Total practice Score		Significance test	P
		Mean	± SD		
Age	30	140.20	± 21.83	F = 1.910	0.157
20-	29	141.93	± 19.83		
25-30-34	6	157.83	± 12.51		
Social Status	46	143.63	± 20.01	t = 0.624	0.535
Married	19	140.11	± 22.38		
Single					
Income	5	146.00	± 21.62	F = 1.085	0.344
Enough & save	32	138.78	± 20.45		
Enough Not enough	28	143.36	± 20.57		
Education	7	151.57	± 19.55	F = 1.293	0.282
Diploma	40	143.40	± 20.86		
Institute Bachelor	18	137.73	± 20.35		
Experience years	48	139.46	± 21.87	F = 2.685	0.076
1-	11	148.09	± 13.40		
5-10+	6	157.67	± 12.11		
Experience years in Pediatric ICU	55	141.09	± 21.36	F = 1.301	0.279
1-	7	147.43	± 11.15		
5-10+	3	159.00	± 18.68		
Yes	42	145.81	± 20.28	t = 1.722	0.090
No	23	136.74	± 20.34		
Time spent with comatose child/day	50	143.50	± 21.90	t = 0.640	0.525
6 hours 12 hours	15	139.61	± 15.85		

(\$) P value is statistically significant at <0.05

Test of significance: FET&T test

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