

## Nursing assessment of early complications of coma patients

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### Abstract

Nursing assessment for coma patients on admission is the basic step for the care to be effective. Assessment must be done every 15 minute. Comatosed patients are completely dependent on nurses as their abilities and protective are impaired. Nurses are responsible for their basic life needs and to prevent complications associated with coma. **Aim:** This study aimed to assess early complications for coma patients. **Research design:** a descriptive research design was used in this study. **Setting:** This study was conducted in emergency Unit at Assuit University Hospital and intensive care unit. **Tools of data collection:** (I) Patient assessment sheet (II) Cardio vascular complications assessments sheet. (III) Respiratory complications assessment sheet. (IV) Gastrointestinal tract complications assessment sheet. (VI) Laboratory investigations sheet. **Results:** the results showed that (77.5%) of Patient had complications of coma. **Conclusion** this study showed that were complications associated with coma affect on all body systems and nursing assessment help to know and treat these complications. **Recommendation:** the study recommends conducting in large number of comatosed patients.

**Keywords:** *Coma, Early complications & Nursing assessment.*

### Introduction

Although many people gradually recover from a coma, other enter vegetative state or die. Some people who recover from end up with major or minor disabilities so nursing assessment for early complications help to avoid delayed of complications (Guerot, et al.; 2012) For the best care, a nurse must perform frequent, systematic, and objective assessments on comatose patients in order to deliver the best care. Assessment must be performed four times every hour during the first hours of coma. Also nurses need to monitor the conscious level as impairments may complicate the existing condition and may cause complications. Maintaining patent air way and breathing must be assess every 2 hours. Arterial blood gases must be interpreted to determine the degree of oxygenation (Smith-Chobanet et al., 2015).

Because their abilities and protective reflexes are impaired, the comatose patients are totally dependent on others. Hepatic coma is usually fatal and necessarily requires immediate care. Nurses are in charge of providing essential services and trying to prevent hepatic coma complications (Borgialli et al., 2016).

Gathering patient information focused on current and past medical history, personal history, nutritional history, and environmental status, along with other things, aids in identifying the cause of coma.

A coma is a state in which a person cannot be awakened. It is also defined as Glasgow Coma Scale

score of 8 lasting 6 hours (Nguyen., 2018) It can occur as a result of damage to the brain stem or cerebral cortex (anatomic coma) or as a result of the widespread (world wide) disturbance of brain metabolic processes (metabolic coma). Coma structural causes include bleeding in or around the brain (e.g., hemorrhagic stroke, intracranial hemorrhage, subdural or hematomas, or a ruptured aneurysm), major stroke with sclerosis, as well as a ruptured aneurysm, major stroke with brain death (cerebral infarction), and to the brain. The carbon monoxide toxin prevents oxygen from reaching the brain. Coma can be caused by a medication overdose or drug or alcohol addiction. Failure of the respiratory, renal, or liver functions may result in coma due to accumulation of waste products inside the brain (Weiss, et al., 2012). Coma can also be affected by lack blood sugar, hypothermia, hyperthermia, and fluid or electrolyte imbalances. Certain pathogens can infect the brain, causing coma (Mattei., 2020).

Breathing disturbances of various types, such as rapid, deep respirations (hyperventilation) or slow, irregular respirations, may be observed. Different breathing patterns indicate brain damage or brain stem dysfunction. Response to painful stimuli, and also purposeful movement such as limb withdrawal, are likely indicators that sensory and motor nervous pathways are intact. In response to pain, abnormal body posture (decorticate or decerebrate) indicates more serious brain damage.

No movement in response to painful stimuli also causes serious brain damage at the brain stem level. Movement or reflex asymmetry may indicate structural damage to one side of the brain (Ehwarieme., 2016).

### Significance of the study:

The study's significance is that comatose patients have a high risk of complications. Several studies in comatose patients have identified a connection between it and mortality rates. According to some studies, comatose patients have an increased complication rate and a worse outcome. Patients who had been comatose had significantly longer hospital stays, which resulted in bed sores, DVT (deep venous thrombosis), pneumonia, malnutrition, foot drop, and wrist drop, all of which increased mortality and morbidity (Teasdale, et al., 2014). Every year, approximately 500 comatose patients are admitted to the intensive care unit at Assiut University Hospital (statistical hospital record 2020). As a result, we conducted this study to assess these same complications of coma patients in this intensive care unit, which will assist such a group of patients in receiving level of care, having fewer complications, getting back to normal everyday routines quickly, and reducing the cost and length of hospital stay.

### Aim of the study

The aim of this study was to assess early complications of coma patients.

### Research question:

What is the types of early complicationsfor coma patients?

## Materials and Methods

### Research design: -

Descriptive research design was used.

### Setting:

The study was in Assiut University Hospital in emergency unit and Intensive Care Unit

### Duration of data collection:

From January 2020 to March 2020

### Sample:

Convenient sample of 60 adult patients from 18years and more admitted to emergency unit and intensive care unit (ICU) with (Hypo glycemc, hepatic, traumatic coma) Assiut University Hospitalwas included in the study

### Study tools:

The study tool was utilized to collect data and included the following:

**Tools of the study: - consist of four tools as following:**

**Tool I: Patient assessment sheet:** developed by researchers after literature review (Ehwarieme, et al.,

2016), this tool is used to assess patient condition and consists of the following parts:

**Part I: Assessment sheet for demographic and clinical data:**

It includes demographic and clinical information about a patient, such as age, gender, and marital status. Clinical data such as diagnosis, previous medical diseases, risk factors, and onset of complaint are examples of clinical data.

**Part II: Assessment of hemodynamic parameters:**

This part is used to assess hemodynamic state. It includes Temperature, pulse and Blood pressure. Those were assessed every two hours for three shifts by the researcher adopted from (Jansson et al., 2014; Wilson et al., 2014).

**Tool II: Cardiovascular system assessment complication sheet (Edema – circulation problem – bleeding):**

**Tool III: Respiratory assessment sheet:**

It includes respiratory rate, rhythm, and Breath sound as (Wheeze, Crepitation and Crackles), Pattern as (Tachypnea, Dyspnea, and Bradypnea), chest infection, oxygen therapy and oxygen saturation were assessed every two hours for three days by the researcher.

**Too IIV: Gastro Intestinal Tract Assessment sheet:**

this tool is used to assess state of gastric intestinal tract and it consists of as following: **Assessment bleeding** it used to assess GIT bleeding.

The type of nutrition (Nasogastric – IV fluids) – (adopted from Bouchard and Cooksley, et al., 2018), and fluids intake and output.

**Tool VI: - Laboratory investigation**

Arterial Blood Gases, Complete Blood Count, Liver Function, Renal Function, Blood Sugar, Blood Culture or swap culture.

### Methodology

#### Preparatory phase

- An official letter approval obtains from dean of the Faculty of Nursing at Assiut to director of Assiut University Hospital. These letters include a brief explanation of the objectives of the study and permission to carry out the study.

- Informed consent was obtained from the head of the emergency department and the head of intensive care unit.

- The tools used in this study were developed by the researcher based upon review of the related literatures.

#### Ethical consideration: -

- Research proposal was approved from Ethical Committee in the Faculty of Nursing.

- There is no risk for study subject during application of the research.

- The study was followed ethical principles in clinical research.

- Written consent was being obtained from the directors and oral informed consent was obtained from patient's relatives that are willing to participate in the study, after explaining the nature and purpose of the study.
- Confidentiality and anonymity will be assured.
- Participants have the right to refuse to participate and or withdraw from the study without any rational any time.

**Content Validity and Reliability:**

Content validity for Tool was established by jury of five experts' professors from emergency nursing department and critical care, who reviewed the tools for clarity, understanding, relevance, comprehensiveness, applicability and easiness for administrative, accordingly necessary modifications were done, and then the tools were designed in the final format and tested for reliability using internal consistency for all tools which was measured using Cronbach test. The tools proved to be reliable (0.827, 0.786 and 0.825 respectively).

**Pilot study:**

Pilot study carried out in that conducted on 10% of the sample in a selected setting to evaluate the applicability, clarity of the tools and identify any difficulties, it was on 10% (6 patients) who added to the study later, it had also provided an estimate of time needed to fill out the tools.

**Implementation phase:**

- During this phase the researcher conducted the assessment process for the patients study.
- Firstly, the researcher greeted the patients, introduced herself and purpose of study was explained to patients' family who agreed to participate in the study prior to any data collection.
- After taking the patient's family oral agreement for voluntary participation in the study, each patient involved in the study was interviewed individually for filling (**Tool I**) patient assessment sheet.
- Each patient was assessed for 24 hours in this study.

**Assessmentcoma patients.**

- Initial assessment begins within first hour of admission and continues for 24 hours after the coma, and includes assessment of (airway, breathing and ventilation, circulation and hemorrhage control).
- Assess airway patency to avoid airway obstruction.
- Assess tissue oxygenation.
- Assess and watch for signs of hypovolemic shock.
- Assessing and promoting adequate nutritional needs.
- Examining the vital signs.
- Calculate and balance total intake and output.
- Take a look on the patients for any complications.
- Assess whether the patient is hypovolemic.
- Look for other signs of a poor cardiac output such as a decreased level of consciousness. If the patient has a urinary catheter, check for reduced urine output

- (urine output of  $< 0.5$  mL kg/hr.) and assess for any signs of external bleeding from wounds or drains.
- Assist with removal of airway secretions as needed.
- If the patient isn't intubated, have supplies ready to possible intubation (**Ahmed & Younis., 2017**).

**Statistical analysis:**

Data entry was done using a compatible personal computer by the researcher. All data were entered into statistical package for the social science (SPSS) version 20.0(Chicago, Illinois, USA) software for analysis and excel for figures. The content of each tool was analyzed, categorized and then coded by the researcher. Data was presented using descriptive statistics in the form of the numbers and percentages, where continuous variables described by mean and standard deviation (mean, SD).

**Result:****Table (1): Distribution demographic and Medical data for participant Patients (n=60)**

Variables	No	%
<b>Age level</b>		
Less than 30 years	4	6.7
From 30- 40 years	6	10.0
from 40- 50 years	8	13.3
From50 to 60 years	42	70.0
<b>Mean±SD(range)</b>	<b>55.85±16.62(14.85)</b>	
<b>Gender</b>		
Male	31	51.7
Female	29	48.3
<b>Past medical history</b>		
Diabetes mellitus (DM)	15	25.0
Diabetesand hyper tension	25	8.3
None	15	25.0
Stroke	1	1.7
<b>Diagnosis</b>		
Hepatic coma	12	20.0
Hypoglycemic coma	12	20.0
Pulmonary Embolism	12	20.0
Stroke	12	20.0
Trauma	12	20.0
<b>GCS</b>	<b>Mean±SD</b>	<b>range</b>
1 <sup>st</sup> shift	8.92±1.61	5-11
2 <sup>nd</sup> shift	11.12±2.39	7-15
3 <sup>rd</sup> shift	11.11±2.48	7-15

**Table (2): Descriptive of vital sings monitoring for Patients (n=60)**

	Mean±SD	Range
<b>Temperature</b>	37.11±0.31	36.5-38
<b>Systolic Blood Pressure</b>	130.45±15.29	96.7-163.3
<b>Diastolic Blood Pressure</b>	84.53±8.51	70-100
<b>Pulse</b>	67.44±7.75	52.3-84
<b>Respiratory rate</b>	15.83±1.2	13-18

**Table (3): Assessment of cardio vascular system patient complications:**

Complications of cardio system	No.	No.
Pulmonary edema	29	48.3
pitting edema	22	36.7
Circulation	41	68.3
Cyanosis	39	65.0
Deep venous thrombosis	16	26.7
Disability	45	75.0
Shock	3	5.0
Bleeding	8	13.3

**Table (4): Distribution of respiratory system complications for participant Patients:**

Respiration complications	No.	
Obstruction	59	98.3
Hypoxia	43	71.7
Aspiration	43	71.7
Apnea	29	48.3
Wheeze	38	63.3
Crackles	15	25.0

Respiration complications	No.	
<b>Pattern</b>		
Tachypnea	15	25.0
Bradypnea	21	35.0
Obstructive sleep Apnea	43	71.7
Wheeze	38	63.3
<b>Rating Scale Dyspnea</b>	Mean±SD	Range
1 <sup>st</sup> shift	3.13±1.27	0±7
2 <sup>nd</sup> shift	1.95±1.69	0±6
3 <sup>rd</sup> shift	1.6±2.17	0±7

Table(5): Distribution of complications of Gastro intestinal tract

	Mean±SD	range
<b>Vomiting</b>	281.25±124.9	100-600
<b>Diarrhea</b>	250±75.59	100-300
<b>Bleeding</b>	288.24±195.68	100-900

Table (6): Descriptive of Laboratory Investigation For patients

	Mean±SD	Range
<b>Blood Picture:</b>		
<b>HB</b>	11.1±1.93	6.2-15
<b>Hematocrit</b>	35.4±8	2.1-50
<b>RBCs</b>	4.22±1.09	1.9-7.5
<b>WBCs</b>	7.68±2.03	5.1-15.1
<b>Platelets</b>	217.48±58.23	137-400
<b>Renal Functions Test</b>		
<b>Urea</b>	32.89±7.64	15-45
<b>Creatinine</b>	1.32±0.4	0.8-2.5
<b>Volume</b>	2784.78±678.88	1000-4500
<b>Liver Function Test</b>		
<b>Serum protein</b>	3.14±1.66	1.1-6.5
<b>Albumin</b>	1.81±0.84	1.2-7.1
<b>Blood Electrolytes</b>		
<b>Na</b>	136.95±16.61	125-196
<b>Mg±2</b>	1.4±0.38	0.5-2.1
<b>P±3</b>	1.76±0.27	1.2-2.1
<b>K±1</b>	4.15±0.9	2.1-6.2
<b>Ca±2</b>	3.85±1.64	0.5-7.2
	<b>Mean ±SD</b>	<b>Range</b>
<b>Arterial Blood Gases</b>		
<b>Po2</b>	114.73±31.11	74-203
<b>Blood PH</b>	7.48±0.1	7.2-7.8
<b>HCO3</b>	25.4±2.44	17-29
<b>Paco2</b>	34.08±5.69	23-69
<b>Prothrombin time</b>	12.51±1.93	7.2-16
<b>Prothrombin concentration</b>	89.18±7.81	70.1-103
<b>INR</b>	1.26±0.33	1-2

**Table (1):** Shows that the highest percentage of studied patients was patients their ages ranged between 50-60 years old with a mean age 55±16.62. also shows that most of patients had past medical history [risk factors] and most of them were

metabolic coma and shows that glasgow coma scale ranged from 5-11 with mean ±1.61

**Table (2):** Reveals that vital signs monitoring that indicated slightly high temperature with range 36.5-38 and reveals that most of patients had slightly high

blood pressure with mean 130.45+-15.29 for systolic and 84.53+-8.51 for diastolic.

**Table (3):** Shows that most of patients had cardio vascular complications there were about 80% had pulmonary and pitting edema and most of patients had disability with per cent 75.

**Table (4):** Reveals that respiratory complications that shows about 98% of patients was had airway obstruction and about of 43% had hypoxia.

**Table (5):** Shows the Gastro Intestinal Tract assessments that were most of patients vomiting, with mean 281.25+-124.9.

**Table (6):** Shows that Laboratory Investigation for patients that shows that most of patient had normal blood picture and renal functions test. It also reveals interpretations of arterial blood gases that indicates disturbance in blood ph with mean 7.48+-0.1.

### Discussion:

Comatose patient is totally dependent on nurses for his or her recovery, nurses use their assessments to provide the sensory stimulation required to activate the reticular system, which is responsible for maintaining consciousness.

(Wijdicks; 2019)

Inaccurate coma management in critically ill patients in intensive care unit may result in problems such as harmful multi - system effects, infection, and prolonged mechanical ventilation. Damage of patients' recovery and discharges is a primary outcome with physiological parameters (temperature and breathing improvement).

The purpose of this study was to determine the impact of nursing assessment on the complications of comatose patients. It was hypothesised that comatose patients receiving nursing assessment would improve consciousness, have a lower incidence of physiological parameters with enhanced all body systems, and have a shorter length of stay in the intensive care unit. (Hoffman et al., 2017)

The results have shown that the patients were homogeneous in their age, sex and all clinical data. The study illustrated that more than half of studied sample was female.

**In terms of demographic data,** the majority of studied patients (42 percent) were between the ages of 50 and 65. These findings are supported by (Alghamdi et al., 2018), who also reported that age is related to coma.

In terms of gender, males made up the majority of the patients studied (51.7 percent). This finding was consistent with the findings of (Bickley et al., 2017), who reported in their study that more than half of the patients were male. A study conducted by (Borgianni et al., 2016) found that slightly more than two-thirds of patients were male, and being male is consistently

associated with coma. This study's results were consistent with those of an earlier study (Smith et al; 2015).

This study also illustrated that the role of nursing assessment to decrease the complication of coma on the patients of ICU or emergency unit. It showed that good progress for those patients to all their body systems.

**In terms of assessment of cardio vascular system** most of patient had edema (pulmonary and pitting) also more than half of patients had circulation problem . Also the results had shown that there were many problems associated with coma in respiratory system such as air way obstruction that were most of patients had it. **In terms of GIT assessment:** this study had shown that most of patients had vomiting and diarrhea.

**Researcher opinion:** In my opinion first table of data indicated that most of patients were old age and had past history of diseases, so I think that those group of people should take care from their life style as they are high risk to be comatose if they do not organize their habits and their medications of different diseases such as diabetes and hyper tension. This study was very important as it indicated that nursing assessment is the most important step to make good nursing care plan for coma patients as it help nurse to collect information about patient disease there for this assessment help also doctors to describe right medications for right diagnosis. Also the present study confirmed that there were many complications associated with coma and there were many factors contribute with this complications as socioeconomic factors and past medical history .

Also the present study showed many complications of coma that affect all body systems which can lead to death ,so this study was made to assess these complications of coma and to know the types of these complications and to help avoid this complications in the next step after patient admit to hospital .In conclusion, from the researcher experience with coma patients experience ,the results of this study apply to the reality that occurs with coma patients and the purpose of this study was achieved.

### Conclusion

Based on the findings of this study, it is possible to conclude that the use of nursing assessments aided in the detection of patient complications and their treatment. Furthermore, it must have been successful in reducing comatose complication.

**Recommendations:**

Recommendations for practice and research based on results of current study, I recommend for future research to: -

- 1- Another study with larger sample size.
- 2- A special sheet for comatosed patients in emergency unit.
- 3- Family members of comatosed patient should be involved in the intervention to promote recovery of their patients.

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