



Nurses' Performance Regarding Management of Patients with Hepatic Encephalopathy at the Endemic Care Unites

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Abstract

Background: Hepatic encephalopathy (HE) is a frequent and severe complication of liver disease with poor patient outcomes, the hyperammonemia is a key factor in the pathogenesis of it. HE reduces the patient's quality of life and increase caregiver's overload. Nurses have a critical role in prevention of complications and it is important to study their level of knowledge, practice, and attitudes. **Study Aim:** Assess nurses' performance regarding management of patient with Hepatic encephalopathy at endemic care unites. **Design:** A descriptive study was utilized to meet the aim of this study. **Settings:** Data were collected from Medicine intensive care units and Endemic ICU at Zagazig University Hospitals. **Subjects:** A convenience sample of all available nurses who working in the above mentioned setting. **Tools of data collection:** Three tools were used, an interview questionnaire, observational checklist, and nurses' attitude assessment likert scale. **Results:** This study revealed that only 14.0% and 24.0% of the studied nurses had satisfactory knowledge and practice level respectively regarding management of patient with HE, while 86% and 76.0% of nurses had unsatisfactory level. As well, 66.0% of the studied nurses had a positive attitude regarding management of patients with HE, while 34.0% of nurses had a negative attitude. **Conclusion:** this study concluded that the majority of the studied nurses have unsatisfactory total knowledge level as well as more than three quarters of them had unsatisfactory total practice level, while two thirds of studied nurses had a positive attitude regarding management of patients with HE. **Recommendation:** The nurses working in the study settings in need for more training to improve their performance regarding management of patients with HE.

Keywords: Nurses' Performance, Hepatic encephalopathy, Endemic Care Unites.

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Introduction:

Hepatic encephalopathy (HE) is a serious complication of liver diseases that manifests with a wide range of neuropsychological clinical findings ranging from minimal HE to coma (Peng et al., 2021). It is a neuropsychiatric syndrome that results in a reversible impairment of brain function which occurs in patients of advanced liver disorders (Ferenci, 2017). Development of HE is attributed to the accumulation of neurotoxic substances including ammonia in the bloodstream as well as the brain (Ali

& Nagalli, 2020), as the liver can't adequately remove toxins from blood and this causes buildup of these toxins in blood stream, which can lead to brain damage.

Hepatic encephalopathy is associated with increased morbidity and mortality and imposes a significant burden on the caregivers and healthcare system (Fallahzadeh & Rahimi, 2020). It is characterized by personality changes, intellectual impairment and a depressed level of consciousness (Medscape, 2020). Initial signs of HE can be hyperreflexia, rigidity, tremors, positive Babinski's sign, or asterixis (jerky movements of hands-on

outstretched arms at wrists). Severe HE presents with agitation, disorientation in time-space and person, somnolence, rapidly developing confusion, and ultimately coma. The physical exam may demonstrate signs of chronic liver disease (**Amodio, 2018**).

Hepatic encephalopathy can be classified as either overt or minimal HE. Overt hepatic encephalopathy (OHE) is a syndrome of neurological and neuropsychiatric abnormalities that can be detected by bedside clinical tests. By contrast, patients with minimal hepatic encephalopathy (mHE) present with normal mental and neurological status upon clinical examination but specific psychometric tests yield abnormal results (**Peng et al., 2021**).

In general, nursing care of patients with HE includes evaluation of mental status, prevention of aspiration pneumonia, assessment of potential triggers of HE (particularly bacterial infections and GI bleeding), nutritional support, prevention of skin breakdown, and bowel cleansing as well as proper administration of medications to control HE is a key for these patients. Also patients with HE should be reoriented to time, place, and person frequently (**Fabrellas et al., 2020**).

The bedside nursing staff spends the most concentrated time with the patient in the hospital setting which puts them in the unique position to recognize the early signs of HE, alert the medical team, and educate the patients and their families on understanding and management of this condition that will lead to more effective outpatient management and decreased need for hospitalizations. Increased

awareness of the nursing staff of the subtle signs of HE, would lead to prompt recognition and appropriate response by the medical team to the patient's changing clinical status in the inpatient setting (**Sohal et al., 2021a**). So, it is very important to study their level of knowledge, practice, and attitudes (**Garrick, Klinger & Stefanich, 2012**).

Significance of the Study:

Hepatic encephalopathy occurs as complications of advanced liver disease such as liver cirrhosis which consider the end-stage of different chronic liver diseases, and is often neglected until complications like hepatic encephalopathy occurs, as 30-45% of patients with cirrhosis develop HE. Egypt had the highest age-standardized mortality rate for cirrhosis and according to the World Health Organization WHO (2017) liver disease deaths in Egypt rank number one in the world (**Saad et al., 2021; Wong & Huang, 2018**). As well, there are approximately 7-11 million cases of HE prevalent in the United States, with approximately 150,000 patients newly diagnosed each year (**Acharya & Bajaj, 2019**).

Nurses are critical in the delivery of essential health services and are core in strengthening the health system (**WHO, 2016**). The role of the nurse in recognizing symptoms of HE is critical to care. Daily assessment by the nurse may prevent symptoms from progressing from minor non-life-threatening to life-threatening issues requiring urgent intervention (**Hagerty, Rustgi & Stefanacci, 2020**). Thus, assess nurses' performance

regarding management of patients with hepatic encephalopathy is more important.

Aim of the Study:

The study aim was to assess nurses' performance regarding management of patients with hepatic encephalopathy at endemic care units at Zagazig University Hospitals through:

- Assess the level of nurses' knowledge regarding management of patients with hepatic encephalopathy.
- Assess the level of nurses' practice regarding management of patients with hepatic encephalopathy.
- Assess the level of nurses' attitude toward management of patients with hepatic encephalopathy.

Subjects and Methods:

Research design:

Descriptive study was utilized to meet the aim of this study.

Study Setting:

This study was conducted in Medicine intensive care units (Hematemesis and Paid ICU) and Endemic ICU at Zagazig University Hospitals.

Subjects:

A convenience sample of all available nurses who working in the Medicine intensive care units (32 nurses) and Endemic ICU (18 nurses) at Zagazig University Hospital during the period of the study. Their total number was 50 nurses.

Tools of data collection:

Three tools were used in the current study as the following:

Tool I: An interview questionnaire:

This tool was designed by the researcher to assess nurses' level of knowledge regarding management of patient with HE based on review of relevant literatures (**Papadakis & McPhee, (2017); Smeltzer et al., (2014)**). It comprised the following parts:

1. Part 1: Nurses' demographic data:

This part is concerned with demographic data of nurses involved in the study as age, sex, social status, and residence, qualification, experience years in nursing field, experience years at endemic and medicine intensive care units, and attendance of training courses about management of patients with hepatic encephalopathy.

2. Part 2: Nurses' knowledge questionnaire:

This part was concerned with assessment of nurses' knowledge regarding management of patients with hepatic encephalopathy. It composed of two sections as the following:

- **The first section** concerned with assessment of nurses' knowledge regarding hepatic encephalopathy disease as definition, signs, symptoms, causes, risk factors, types, grades, diagnosis, methods of treatment, and complications, which consists of 23 questions in the form of multiple choice questions (MCQ).
- **The second section** concerned with assessment of nurses' knowledge regarding nursing care of patients with hepatic encephalopathy, which consisted of 33 questions (22 questions in the form of MCQs and 11 questions in the form of true and

false) .a correct answer was scored 1 and the incorrect zero. The knowledge was considered satisfactory if the percent score was 70% or more and unsatisfactory if less than 70% based on data entering and statistical analysis.

Tool II: Nurses' attitude Likert scale:

This tool is used to assess nurses' attitude regarding management of patient with hepatic encephalopathy; it was developed by the researcher after reviewing the pertinent literature review (AbdELaziz, 2015; Abdu & Hasssan, 1997). It is composed of 14 item or statements that either positively or negatively worded. in which responses were answered in a 2-point Likert scale as "agrees and disagree"; in the positively worded statements, the choice of agree was given "one" and disagree was given "zero" while in negatively worded statements the choice of agree was given "zero" and disagree was given "one" the attitude was considered "positive" if the percent score was $\geq 70\%$ and "negative" if $< 70\%$ based on data entering and statistical analysis.

Tool III: Practice Observational checklist:

This tool was used to assess the adequacy of nurse's practice regarding the care of patients with hepatic encephalopathy. It was developed by the researcher based on pertinent literature Checklists for Nettina, (2014); Wilkinson et al., (2016). It covered the following areas of practice. Each practice item observed to be done correctly was scored 1 and the not-done zero. The practice was considered satisfactory if the percent score

was 70% or more and unsatisfactory if less than 70% based on data entering and statistical analysis.

Validity and reliability of the tool:

Once the tool was prepared in their preliminary form, the data collection tools were presented to a panel of three experts from nursing field, these include three professors of medical surgical nursing from faculty of nursing at Zagazig University. These experts reviewed the tools for relevance comprehensiveness, accuracy, clarity, and ease of administration. Minor modifications were done according to the experts' judgement. Internal consistency reliability of all items of the tools was assessed using a Chronbach's Alpha test and presented as the following: 0.84 for knowledge (tool I), 0.86 for attitude (tool II), and 0.64 for practice (tool III).

Ethical consideration:

The research approval was obtained from the faculty ethical committee before starting the study. The researcher clarified the objectives and aim of the study to nurses include in the study before starting. Researcher assured the anonymity and confidentiality of the nurses included in the study. The nurses under study were informed that they are allowed to choose to participate or not in the study and they have the right to withdraw from the study at any time without giving any reasons. The researcher assured that the data collected and information will be confidential and would be used only for the purpose of study.

Pilot study:

A pilot study was conducted on five nurses representing 10% of the main study sample. The purpose of the pilot was to check and ensure the clarity, applicability, and feasibility of the tools, to identify the difficulties that may be faced during data collection. It also helped to estimate the time needed to fill-in the forms. Since no modifications were done in the tool, those who shared in the pilot study were included in the main study sample.

Field work:

The researchers secured all necessary permissions from the Director of Zagazig University Hospital, the General Medical Hospital, and the ICU directors. The researcher visited the study settings, met with the director, explained to them the aim of the study as well as the process of collection of the data to have their cooperation during data collection and to set its schedule so that it does not interfere with nurses' work. The researcher then met with the nurses individually, explained to them the aim of the study and the process of collection of the data, and invited to participate after being informed about their rights.

The researcher met with each nurse individually to fulfil the questionnaires that related to nurses' knowledge and attitude, while observational checklist was collected by the researchers through

observing the nurses during their actual practices with the patients. The average time required for the completion of each tool was around 30-40 minutes. The data collection process of this study was carried out through seven months in the period from the beginning of April to the end of October (2020). The researcher collected data from two shifts, the morning and the afternoon shifts, three days per week.

Statistical Analysis

All data were collected, tabulated and statistically analyzed using SPSS 20.0 for windows (SPSS Inc., Chicago, IL, USA 2011). Quantitative data were expressed as the mean \pm SD & (range), and qualitative data were expressed as absolute frequencies (number) & relative frequencies (percentage). Percent of categorical variables were compared using Chi-square test or Fisher's exact test when appropriate. Spearman correlation coefficient was calculated to assess relationship between various study variables, (+) sign indicate direct correlation & (-) sign indicate inverse correlation, also values near to 1 indicate strong correlation & values near 0 indicate weak correlation. All tests were two sided. P-value $<$ 0.05 was considered statistically significant (S), and p-value \geq 0.05 was considered statistically insignificant (NS).

Results:

Table 1: Frequency and percentage distribution of demographic characteristics of studied nurses (n=50).

Demographic characteristics	Frequency	Percent
Age per years:		
- <35	27	54.0
- ≥35	23	46.0
Mean ±SD	31.6±7.6	
Range	19-43	
Sex:		
- Male	12	24.0
- Female	38	76.0
Social status:		
- Single	17	34.0
- Married	33	66.0
Residence:		
- Rural	24	48.0
- Urban	26	52.0
Qualification:		
- Diploma	23	46.0
- Technical institute	20	40.0
- Bachelors	7	14.0
Experience years in nursing field:		
- <10	17	34.0
- ≥10	33	66.0
Mean ±SD	12.5±7.2	
Range	6 months-25	
Experience years at intensive care unit (ICU):		
- <5	26	52.0
- ≥5	24	48.0
Mean ±SD	4.8±3.2	
Range	2 months -13	
Attendance of training courses about management of patients with HE:		
- Yes	32	64.0
- No	18	36.0

Table 1 clarifies that studied nurses' age range between 19 - 43 with mean± SD 31.6±7.6 years, more than three quarters (76%) of the studied nurses were females, 66.0% of nurses were married, and 52% living in urban area. Regards qualification, the same table shows that the highest percentage (46%) of studied nurses had diploma degree, while only 14% of nurses had bachelor's degree. In addition, two thirds

(66.0%) of studied nurses had ≥10 experience years in nursing field, while more than half (52%) of nurses had < 5 experience years at medicine and endemic ICU. Furthermore, the current table shows that more than three fifths (64%) of studied nurses had attended training courses about management of patients with hepatic encephalopathy.

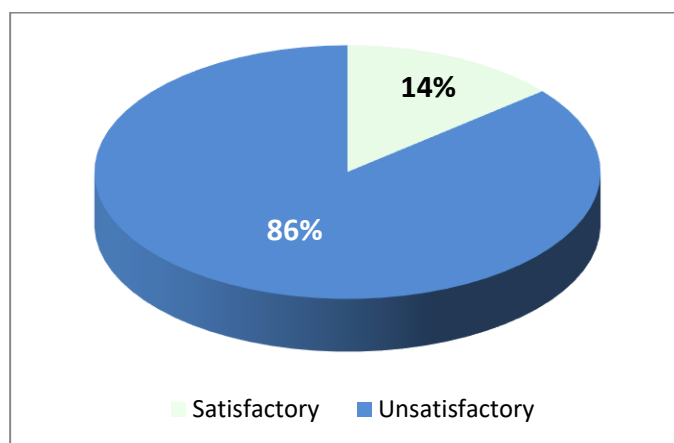


Figure (1): Total Nurses' Knowledge regarding Management of Patients with Hepatic Encephalopathy (n= 50)

Figure 1 demonstrates that only 14.0% of the studied nurses had satisfactory knowledge level, while 86% of studied nurses had unsatisfactory level knowledge regarding management of patients with hepatic encephalopathy.

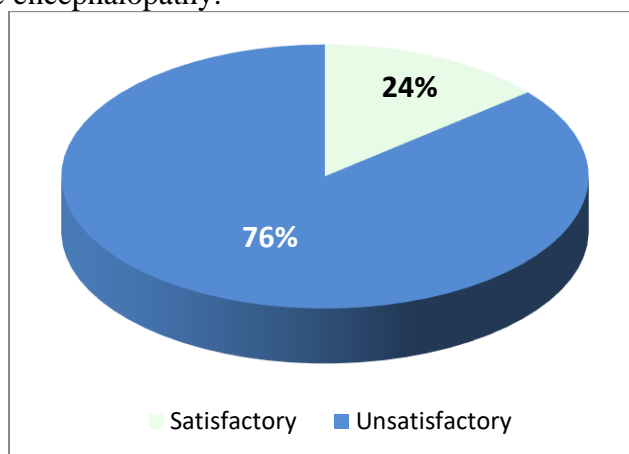


Figure (2): Total Nurses' Practice regarding Management of Patients with Hepatic Encephalopathy (n= 50)

Figure 2 illustrates that only 24.0% of the studied nurses had satisfactory practice level, while 76.0% of nurses had unsatisfactory practice level regarding management of patients with hepatic encephalopathy.

Table 2: Nurses' Attitude regarding Management of Patients with Hepatic Encephalopathy (HE) (n=50):

Total Nurses' Attitude Level	No.	%	Mean \pm SD	Range
Positive attitude	33	66.0	10.2 \pm 1.9	8-13
Negative attitude	17	34.0		

Table 2 illustrates that two thirds (66.0%) of the studied nurses had a positive attitude regarding management of patients with hepatic encephalopathy with mean \pm SD 10.2 \pm 1.9 and range from 8 to 13, while 34.0% of nurses had a negative attitude.

Table 3: Relation between Nurses' Total Knowledge regarding management of patient with Hepatic Encephalopathy and their Demographic Characteristics (n=50):

Demographic characteristics	Nurses' Total Knowledge Level				f p-value
	Satisfactory $\geq 70\%$		Un satisfactory $< 70\%$		
	n.	%	n.	%	
Age per years:					
- <35	4	14.8	23	85.2	0.99
- ≥ 35	3	13.0	20	87.0	
Sex:					
- Males	1	8.3	11	91.7	0.99
- Females	6	15.8	32	84.2	
Social status:					
- Married	4	12.1	29	87.9	0.68
- Single	3	17.6	14	82.4	
Residence:					
- Rural	4	16.7	20	83.3	0.7
- Urban	3	11.5	23	88.5	
Qualification:					
- Diploma	2	8.7	21	91.3	$\chi^2 =$ 0.18 P=0.41
- Technical institute	3	15.0	17	85.0	
- Bachelors	2	28.6	5	71.4	
Experience years in nursing field:					
- <10	3	17.6	14	82.4	0.68
- ≥ 10	4	12.1	29	87.9	
Experience years at endemic and medicine ICU:					
- <5	3	11.5	23	88.5	0.7
- ≥ 5	4	16.7	20	83.3	
Attendance of training courses:					
- Yes	6	18.8	26	81.3	0.4
- No	1	5.6	17	94.4	

χ^2 :Chisquare test f :Fisher Exact test (s) p:<0.05 Significant p:>0.05 Insignificant

Table 3 shows that there was statistically insignificant relation between nurses' total knowledge level regarding management of patient with HE and their demographic characteristics as $p > 0.05$.

Table 4: Relation between Nurses' Total Practice regarding management of patient with Hepatic Encephalopathy and their Demographic Characteristics (n=50):

Demographic characteristics	Nurses' Total Practice Level				χ^2	p-value
	Satisfactory $\geq 70\%$		Unsatisfactory $< 70\%$			
	n.	%	n.	%		
Age per years:						
- <35	3	11.1	24	88.9	5.4	0.02 (S)
- ≥ 35	9	39.1	14	60.9		

Sex: - Males - Females	0 12	.0 31.6	12 26	100.0 68.4	f	0.047 (S)
Social status: - Married - Single	10 2	30.3 11.8	23 15	69.7 88.2	f	0.18
Residence: - Rural - Urban	8 4	33.3 15.4	16 22	66.7 84.6	2.2	0.14
Qualification: - Diploma - Technical institute - Bachelors	9 1 2	39.1 5.0 28.6	14 19 5	60.9 95.0 71.4	6.9	0.03 (S)
Experience years in nursing field: - <10 - ≥10	1 11	5.9 33.3	16 22	94.1 66.7	f	0.039 (S)
Experience years at endemic and medicine ICU: - <5 - ≥5	1 11	3.8 45.8	25 13	96.2 54.2	12.1	0.001 (S)
Attendance of training courses: - Yes - No	11 1	34.4 5.6	21 17	65.6 94.4	f	0.036 (S)

χ²:Chisquare test f:Fisher Exact test (s) p:<0.05 Significant p:>0.05 Insignificant

Table 4 clarifies that there was statistically significant relation between nurses' total practice level regarding management of patient with HE and their age (p=0.02), sex (p=0.047), education (p=0.03), experience years in nursing field (p=0.039), experience in endemic and medicine ICU (p=0.001). It is obvious that nurses' practice level better among female nurses

whose age ≥35 years old and diploma graduated. In addition nurses who spend long experience years in nursing field especially at endemic and medicine ICU units and who's attained training courses regarding management of patient with hepatic encephalopathy had better practice.

Table 5: Relation between Nurses' Total Attitude regarding management of patient with Hepatic Encephalopathy and their Demographic Characteristics (n=50):

Demographic characteristics	Nurses' Total Attitude Level				χ ²	p-value
	Positive attitude ≥70%		Negative attitude <70%			
	n.	%	n.	%		
Age per years: - <35 - ≥35	21 12	77.8 52.2	6 11	22.2 47.8	3.6	0.057
Sex: - Males - Females	9 24	75.0 63.2	3 14	25.0 36.8	f	0.51

Social status:						
- Married	21	63.6	12	36.4	0.24	0.62
- Single	12	70.6	5	29.4		
Residence:						
- Rural	17	70.8	7	29.2	0.48	0.49
- Urban	16	61.5	10	38.5		
Qualification:						
- Diploma	13	56.5	10	43.5	2.3	0.32
- Technical institute	14	70.0	6	30.0		
- Bachelors	6	85.7	1	14.3		
Experience years in nursing field:						
- <10	14	82.4	3	17.6	3.1	0.08
- ≥10	19	57.6	14	42.4		
Experience years at endemic and medicine ICU:						
- <5	21	80.8	5	19.2	5.3	0.02 (S)
- ≥5	12	50.0	12	50.0		
Attendance of training courses:						
- Yes	19	59.4	13	40.6	1.7	0.19
- No	14	77.8	4	22.2		

χ²:Chisquare test f :Fisher Exact test (s) p:<0.05 Significant p:>0.05 Insignificant

Table 5 reveals that there was statistically significant relation between nurses' total attitude level regarding management of hepatic encephalopathy patients and their experience at endemic and medicine ICU

units (p=0.02). It is obvious that nurses who had short period of experience (less than five years) had positive attitude regarding management of hepatic encephalopathy patients.

Table 6: Correlation matrix between nurses' Total knowledge score, practice score, attitude score, factor affecting nurses' performance score, age of nurses and experience per years (n=50) :

Parameters	Total Knowledge score		Total Attitude Score		Total Practice Score	
	(r)	p	(r)	p	(r)	P
Total Attitude score	0.26	0.07				
Total Practice score	0.35*	0.014	-0.01	0.93		
Age per years	0.06	0.6	-0.53*	0.0001	0.3*	0.03
Experience years in nursing field:	-0.07	0.62	-0.53*	0.0001	0.4*	0.004
Experience years in medicine and endemic ICU:	0.28	0.053	-0.38*	0.006	0.43*	0.002

(r) Correlation coefficient

*significant p<0.05

Table 6 shows that there was statistically significant positive correlation between nurses' knowledge score and practice score

(p=0.014), while there was statistically significant negative correlation between studied nurses' attitude score and their age (p=0.0001), experience years in nursing

field ($p=0.0001$), and experience years in medicine and endemic ICU units ($p=0.006$). As well as, there was a statistically significant positive correlation between nurses' practice score and age of

nurses ($p=0.03$), experience years in nursing field ($p=0.004$), and experience in medicine and endemic ICU units ($p=0.002$).

Discussion

Early detection of any abnormal symptoms/signs and proper management and follow-up is effective in reducing the rate of hospital re-admissions of patient with hepatic encephalopathy (**Chauhdry, 2022; Mitchell et al., 2022**). Patients with HE require nursing care anywhere in the healthcare system. Therefore it is beneficial for all nurses to have a basic knowledge and practice about HE (**Bager, 2017**). Therefore, the study aim was to assess nurses' performance regarding management of patient with hepatic encephalopathy at endemic care units at Zagazig University hospitals.

The main findings of the current study indicate that a generally large proportion of the nurses have unsatisfactory knowledge and practice regarding management of patient with hepatic encephalopathy, while two thirds of the studied nurses had a positive attitude regarding management of patients with HE. This part discussed the results of the current study comparing them with the recent literature and other relevant studies. A discussion will be covered five main parts in the following sequences:-

Part I. Demographic characteristics of studied nurses:

The present study sample involved 50 nurses; more than half of studied nurses their age below thirty-five years. This finding is consistent with **Abd-Elrhaman & Ghoneimy (2019)** who assessed "Effectiveness of Educational Program Regarding Professional Nursing Ethics on Workplace Civility" which conducted at

ICU units at Benha University Hospital; found that; the majority of the nurses' ages ranged from 25-35 years .

The current study revealed that the highest percentage of studied nurses were females, has either diploma degree or technical institute in nursing. The high ratio of female to male nurses is still reported in many studies since the admission of male students in nursing schools only dates less than two decades so that the nursing workforce is still more feminine. Many studies are confirming this (**Abdallah, 2013; Bin Usamah, 2017**).

This finding agrees with **Mahmoud et al., (2021)** who mentioned in study titled "Impact of Educational Program for Hepatic Encephalopathy on Nurses Performance and Patients Outcomes" that majority of nurses under study were having diploma degree from technical nursing institute and about two thirds of nurses were female.

Also, **Ahmed (2018)** study entitled "Nurses' Performance regarding Management of Patients with Hepatic Encephalopathy"; his results concerning the level of education show that most of nurses were nursing Institute graduate. While these findings were disagreed with **Abd Elhaq, (2018)** who mentioned in her master thesis entitled "Nurses' performance regarding management of patients with hepatic encephalopathy" at Ain Shams University, that more than half of studied nurses were male.

Regarding to the social status and experience years of studied nurses, the present study found that two thirds of

studied nurses were married and had ≥ 10 experience years in nursing field. This finding is agree with **Mohamed (2021)** who mentioned in study entitled "Effect of critical nursing management on hepatic encephalopathy patients' outcomes", that more than three quarters of studied nurses were married and had ≥ 10 experience years. While this finding was disagreed with **Mahmoud et al., (2021)** who revealed that more than half of studied nurses were single.

Concerning experience years of studied nurses at endemic and medicine ICU, the current study revealed that more than half of nurses had < 5 experience years at endemic and medicine ICU. This finding is consistent with **Mahmoud et al., (2021)** who mentioned that about two thirds of studied nurses had less than 5yrs experience in Intensive Care Units at Benha University Hospital.

As regard to attendance of training courses about management of patients with hepatic encephalopathy, this study reported that than three fifths of studied nurses had attended training courses about management of patients with hepatic encephalopathy. This finding agreed with **Ahmed, (2016)** who revealed that training courses and programs are two components of nurses' development. Thus her study recommended that continuous education in nursing is needed to promote development of knowledge and practice and improve quality of care for patients. The training courses played important role in enhancing and updating nurses' knowledge and performance.

Part II: Nurses' Total knowledge regarding management of patients with hepatic encephalopathy:

With respect to *total nurses' knowledge* regarding management of patient with hepatic encephalopathy, the current study

demonstrate that the majority of the studied nurses had unsatisfactory total level of knowledge, this might be due to that the wide base of nurses' education were either nursing diploma or technical institute, lack of motivation, ICU nurses had not enough time to frequent attend conferences and workshops to enrich and update knowledge, ICU work load with shortage of the staff number and insufficient courses.

This finding in the same line with **Mahmoud et al., (2021)** who revealed that more than three quarters of the studied nurses have unsatisfactory level of total knowledge on pre-implementation of the designed program. As well, **Morton & Fontaine (2017)** confirmed that nurses must have knowledge and experience and that improve patient outcome .Moreover, **Linton, (2016)** assured that, the nurse should have much knowledge and skills in the clinical aspects of nursing. Nurses should continue learning to enrich their knowledge because health care system and knowledge about health care is continually changing and growing.

Moreover, **Chaney, Werner, and Kipple, (2015)** emphasized that the nurse practitioner should enrich knowledge about prevention and management of hepatic encephalopathy that play a vital role in improving health care outcomes. Also, **Skår, (2010)** confirmed that understanding knowledge which used in everyday nursing practice is required to improve of educational preparation and quality in health care. Likewise, **Ann, (2002)** emphasizes that inadequate nurses' knowledge and performance indicate poor quality of the care given.

While this result is in contrast to **Alradi, (2013)** who found in her study about "Nurses' Knowledge and practice regarding Care of Patient with Hepatic

Encephalopathy in Ibsina Hospital" that the total nurses knowledge regarding care of patient with hepatic encephalopathy was about 75.7% this is good result. This acceptable good knowledge because most of nurses with higher degree of qualification and have a long experience.

Part III. Nurses' Total practice regarding management of patients with hepatic encephalopathy:

With respect to *total nurses' practice* regarding management of patients with hepatic encephalopathy, this study revealed that less than one quarter of the studied nurses had satisfactory total practice level, while more than three quarters of studied nurses had unsatisfactory practice level regarding management of patients with HE. From the point of the researcher's view, this could be due to the unsatisfactory knowledge of the studied nurses which affect negatively on their practices as well as the highest percentage of studied nurses had diploma degree, they were newly graduated, their experience years at medicine and endemic ICU less than five years, additionally bachelor degree nurses usually worked as a head nurses not bedside when they worked in governmental hospital.

Moreover, this could be due to shortage of staff nurses which leads to work overload in these units, poor management of nurses time and lack of job description which lead to overlapping of the basic nurses activities by non nursing activities, in addition to insufficient financial reward to the nurses, unavailability of guideline books about the nursing care, and lack of frequent in-service training.

The current study in the same context with **Abd Elhaq, (2018)** who revealed that all nurses got unsatisfactory level of practice regarding management of patients with HE without intervention program. In

addition **Nasr et al., (2018)** found that there was a statistical significant difference and improvement between the critical care nurses' level of practice before and immediately after application of teaching program regarding end of life care for hepatic patients. Moreover, **Alradi, (2013)** highlighted nurses' practice deficiency without educational program. This poor result practices regarding HE lead to poor patient' outcome and this deficiency may related to lack of training courses and some facilities. Good supervision is recommended to increase the quality of patient care.

Part IV: Nurses' attitude regarding management of patients with hepatic encephalopathy:

Regarding the total nurses' attitude, the results of the present study revealed that two thirds of studied nurses had positive attitude regarding management of patients with hepatic encephalopathy. This finding could be attributed to awareness of studied nurses with the importance of emotional support to such group of patients .The current result in the same line with **Moghazy, Mohammed, and Saleh (2021)** who revealed that more than two-thirds of studied nurses (68.6%) had a positive attitude, and 31.4% of them had a negative attitude in the post-intervention phase of the protocol.

As well, the current result is consistent with **Getaneh et al., (2019)** who mentioned that about half of the studied sample had good knowledge and a good attitude toward SSI prevention practices. Also, this finding is supported by **Zucco et al., (2019)**, who concluded that while changing behavior is very complex, promoting education lead to changes in attitudes and to improve practices. While, the current result is not consistent with **Zedan et al., (2020)** who found that there

were statistically significant differences in the nurses' positive attitude regarding care of patients with chest trauma during the emergency period as it was improved from only two-fifths pre-implementation of the educational program to more than four-fifths post its implementation. Moreover, **Singh, (2017)** stated that, nurses should have a positive attitude towards patients and their care.

Part V: Relations and correlation between the study variables:

Concerning the *relation between nurses' total knowledge and their demographic* characteristics, the finding of the present study revealed that there was no statistically significant relation between nurses' total knowledge level regarding management of patient with hepatic encephalopathy and their demographic characteristics.

This result is congruent with **Ahmed, Mohammed & Mohammed (2021)** who revealed that there was no statistically significant association between nurses' characteristics and their knowledge level as $p > 0.05$. Also, **Hamed, (2017)** stated that no statistical significance relation between nurses demographic data and their total knowledge about minimal HE. While this finding inconsistent with **Khalifa, Talaat & Hussein (2021)** who clarified that there was a statistically significant relation between satisfactory nurses' knowledge level with nurses' experience years and education. In addition, **Bae & Roh, (2020)** showed in the study entitled "Training needs analysis of Korean nurses' neurological assessment competency" that educational level improves nurses' knowledge level.

Concerning the *relation between nurses' total practice and their demographic characteristics*, the finding of the revealed that there was statistically

significant relation between nurses' total practice level regarding management of patient with HE and their age, sex, qualification, experience years in nursing field, and experience in medicine and endemic ICU. It is obvious that nurses' practice level better among female nurses whose age ≥ 35 years old and diploma graduated. In addition nurses who spend long experience years in nursing field especially at medicine and endemic ICU units and who's attained training courses regarding management of patient with hepatic encephalopathy had better practice.

This finding agrees with **Mohamed, (2021)** who expressed that there was a statistically significant relation between satisfactory nurses' practice level and their age and years of experience at pre and post program application and indicated that nurses whose age ≥ 30 years with experience years ≥ 10 years had satisfactory practice level regard critical nursing management for HE throughout study phases more than other nurses. Too, the current results are consistent with **Ahmed, Abd Elsatar & Khalil (2021)** who clarified in the study about "Assessment of Nurses' Knowledge and Practice Regarding Care for Patients with Spinal Cord Injury in the Critical Care Unit" that there was statistically significant relation between total competent practice level of studied nurses and their educational level.

Concerning the *relation between nurses' total attitude and their demographic characteristics*, the finding of the present study revealed that there was statistically significant relation between nurses' total attitude level regarding management of patients with hepatic encephalopathy and their experience at medicine and endemic ICU units. It is obvious that nurses who had short period

of experience (less than five years) had positive attitude regarding management of hepatic encephalopathy patients.

This finding agreed with **Moghazy, Mohammed, and Saleh (2021)** who found that there was a statistically significant relation of nurses' attitude with nurses' age, gender, residence, academic qualification, income; nurses' experience years in the nursing field, and attending training courses. Too, the current results are in the same line with **Labeau et al., (2008)** who reported that the more experienced the nurses the more knowledge, attitude and practice they have in ICU. While, this finding conflicted with **Suliman, Aloush, and Al-Awamreh (2017)** who conducts a study entitled "Knowledge, attitude, and practice of intensive care unit nurses about physical restraint" and demonstrated that no significant differences between gender, work place, and education level in relation to attitude and practice

Regarding to the *correlation between the knowledge score and practice score*, the present study revealed that there was statistically significant positive correlation between nurses' knowledge score and practice score. The result of the current study in the same context with **Salem, Ali, Taha, (2022)** who mentioned that there was a strong positive relationship between the total knowledge score and the total practice score with highly statistically significant p value (0.0001). Also, these results come to an agreement with **Khalifa, Talaat & Hussein (2021)** who clarified that a statistically significant relation between satisfactory nurses' knowledge and nurses' practice.

Regarding to the *correlation between studied nurses' attitude score and their age, and experience years*, the present study revealed that there was statistically

significant negative correlation between studied nurses' attitude score and their age, and experience years. The current results are in the same line with **Moghazy, Mohammed, and Saleh (2021)** who found that there was a statistically significant relation of nurses' attitude with nurses' age, gender, residence, academic qualification, income; nurses' experience years in the nursing field, and attending training courses.

Regarding to the *correlation between nurses' practice score and age of nurses, experience years in nursing field and ICU units*, the present study revealed that there was statistically significant positive correlation between nurses' practice score and age of nurses, experience years in nursing field and experience in medicine and endemic ICU units. The current finding is consistent with **Summers & McLeod, (2017)** who found that nurses' knowledge and experience are the most significant factors influencing nurses' performance of GCS. As well, **Eskander, Morsy, and Elfeky (2013)** illustrated that there is a positive correlation between mean practice scores and age and years of experience. Also, **Delucia, Ott, and Palmieri (2009)** demonstrate that nurses' performance is influenced by work experience.

In summary, the finding of this study revealed that there is a need to focus on development of nursing staff knowledge, attitude and practice regarding hepatic encephalopathy, so effort should be directed towards enhancing level of knowledge and skills among critical care nurses. Also, the administrative department efforts should be directed toward improving the attitude, motivation, and personality of nurses, such as training, supervision, and rewards. Furthermore, the nurses must seek better ways to update

information, learning resources, and continuous education opportunities to ensure good quality of care.

Conclusion:

The study results lead to the conclusion that a large proportion of the nurses in the study settings have unsatisfactory knowledge and practice regarding management of patients with hepatic encephalopathy as the majority of the studied nurses have unsatisfactory total knowledge level as well as more than three quarters of them had unsatisfactory total practice level. While, the current study concluded that two thirds of studied nurses had positive attitude regarding management of patients with hepatic encephalopathy.

Recommendations

Based on the current study results, the study recommends the following:

- The nurses working in the study settings need more training to improve their knowledge and practice regarding management of patients with HE.
- The nurses with positive attitude should have regular rewards, motivation, and encouragement from the nursing management and the hospital administration.
- Further research is proposed to assess the value of specialized training interventions on nurses' performance in the care of patients with hepatic diseases, and on the incidence of hepatic encephalopathy among these patients.

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