Factors Affecting Clinical Outcomes among Patients with Bleeding Esophageal Varices

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Abstract

Background: Bleeding esophageal varices is a serious complication of portal hypertension. Bleeding esophageal varices is associated with higher mortality and higher hospital costs..**Aim of the study**: The present study aims to assess factors affecting clinical outcomes among patients with bleeding Esophageal varices.**Research design**: A descriptive exploratory research design was utilized in this study. **Setting:** The study was conducted at the critical care units at Mahalla hepatology teaching hospital. **Subjects:** A purposive sample of (98) patients with bleeding esophageal varices, and a convenient sample of all available nurses (38) nurses in the previously mentioned setting.**Data collection tools:** Data were collected through the following tools, ToolI: Patient interview questionnaire, Tool II: Nurses' assessment tool,Tool III:environmental assessment tool, Tool IV: clinical outcomes assessment tool. **Results:** Near three quarter of the studied patients (73.5%) had an unsatisfactory knowledge regarding bleeding esophageal varices. More than three qaurters of studied nurses (76.3%) had a satisfactory level of total knowledge. Also, the majority of the studied nurses (78.9%) had satisfactory level of practice regarding care patients with esophageal varcies. **Conclusion**: The majority of the studied patients had lack knowoldge about bleeding esophageal varices. However, the majority of nurses demonstrated acceptable knowledge and practical abilities in managing patients with this illness. There was a strong direct association between the nurses' knowledge levels and their practical care skills. Several critical criteria were identified as significant predictors of patient outcomes, including nursing staff academic qualifications, patient and nurse levels of knowledge, practical application of nursing care, environmental factors, and patient-specific characteristics. **Recommendations**: On-going regular educational and training programs to study patients to improve their knowledge about bleeding esophageal varices: Education is critical, but it is a longer-term strategy compared to direct patient care.

Keywords: Clinical Outcomes, Bleeding esophageal Varices, factors.

Introduction

Esophageal varices bleeding is an acute clinical problem with acute gastrointestinal bleeding with manifestations of hematoma (bloody vomiting), with or without melena or hematochezia (bloody stools). Hemodynamic instability is also typical . Bleeding from esophageal varices is the major complication of cirrhotic portal hypertension, accounting for 10 to 30% of all cases of upper gastrointestinal bleeding .Esophageal varices bleeding is associated with higher mortality and higher hospital costs than other causes of gastrointestinal bleeding. Esophageal varices occur in 30% of cirrhotic patients, responsible for 80 to 90% of their bleeding **(Yaru et al., 2022).**

Esophageal varices are enlarged and abnormal veins located in the lower part of the esophagus. Varices result from portal hypertension, which develops when the blood pressure in the portal veins rises above ten mmHg. This rise is caused by scar tissue or a clot restricting the liver's normal blood supply. Varices form when blood bypasses the larger vessels and flows through the small vessels in the esophagus **(Mohammed et al.,2023).**

Factors that contribute to Esophageal varices bleeding are any conditions that increase the abdominal venous pressure such as muscular exertion from lifting heavy objects, straining at stool, sneezing, coughing and vomiting. Esophagitis, irritation of vessels by poorly chewed foods or irritating fluids, ingestion of foods high in roughage and

reflux of stomach content can also precipitate for Esophageal varices bleeding, understanding illness perceptions is critical for providing effective treatment. Patients with chronic conditions may actively construct their own personal models of illness in an attempt to deal with the impact of their condition **(Topan et al., 2021).**

The nurse's role as a health educator has great impact on public perceptions of esophageal varices and its care. Patient education, defined as any set of planned educational activities designed to improve patients' health behaviors and health status. It is thought to be beneficial in helping patients to cope and co-operate with their disease and its management. Because of the chronicity of the disease, patients must learn to manage and cope with esophageal varices on a day-to-day basis **(Shahin et al.,2020).**

Nursing assessment for EV patients' knowledge and concern act as a base to increase their awareness about the risk factors, signs and symptoms, self-diagnosis, preventive measures, active involvement in management, and importance of adherence to treatment and health behaviors to promote safe and high-quality patient care. Patient teaching is accepted as an integral part of nursing practice; the teaching process can be seen as parallel to the nursing process in that each has an assessment, diagnosis, goal, intervention and evaluation phase**(Mohamed et al .,2021).**

Significance of the study:

Acute variceal hemorrhage is a serious cause of mortality in the emergency department and can be difficult to treat. In general, upper (GI) hemorrhage accounts for 102 hospitalizations per 100,000 people every year, and esophageal varices represent approximately 14% of these cases. Furthermore, esophageal varices are the most common cause of persistent and sever upper GI hemorrhage, accounting for approximately 33% of these events. Among patients with cirrhosis, 70% of upper GI bleeding episodes are caused by esophageal varices. Gastroesophageal varices exist in nearly 50% of patients with cirrhosis at the time of initial diagnosis **(Guinazu et al., 2023).**

In Egypt, it was estimated that esophageal varices are the commonest cause of upper gastrointestinal hemorrhage, it develops in about 50-63% of patients with liver cirrhosis **(Nickum et al., 2019).** Esophageal varices could cause shock, various infections like pneumonia, peritonitis, and bloodstream infection when left untreated. Patients and their physicians should be vigilant. Over half of the patients hospitalized because of esophageal varices that are diagnosed with an infection. The rate of mortality in patients with esophageal varices is high with 20-35 percent **(Mohamed, 2023).**

Aim of the study

This study aims to assess factors affecting clinical outcomes among patients with bleeding Esophageal varices through the following:

- Assess factors affecting clinical outcomes (human- non human)among patients with bleeding esophageal varices

-Assess clinical outcomes among patients with bleeding esophageal varices

Subjects and methods

Research Design:

A descriptive exploratory research design was utilized in this study.

Research Setting:

The study was conducted in the critical care units at Mahalla hepatology teaching hospital, which is one building consists of four floors: first floor contains management offices, reception, laboratories, radiology, head nurse office. Second floor includes intensive care units with 10 beds, gastrointestinal endoscopy unit and operation rooms. Third floor contains ward department for male patients, finally, the fourth-floor ward department for female patients.

Subjects:

A purposive sample of (98) patients with bleeding esophageal varices based on power analysis calculated by (G Power analysis) (multivariate, two tail, Effect size = 0.25, α = 0.05, Power (1-β) = 0.95) with numerical predictors.

Eligible criteria:

-Adult conscious patients from both genders with bleeding esophageal varices.

-Patients free from malignancy.

-A convenient sample of all available nurses (38 nurses) in the previously mentioned setting.

Data collection tools:

Data was collected using the following tools:

Tool (I) Patient interview questionnaire: It included the following three parts:

Part (1) Demographic characteristics of patient's: it was used to collect patient's personal data such as: age, sex, academic qualification, marital status, occupation, and residence.

Part (2): Patient's medical data : It was utilized to obtain data about medical history of patients including comorbid diseases, prescribed and over the counter medications.

Part (3) patients' knowledge assessment sheet: It was developed by the investigator to assess patients' knowledge regarding bleeding esophageal varices after reviewing recent related literature **(Tandon et al., 2018; Sharma et al., 2019),** which includes definition, causes, signs and symptoms, complications, diagnosis, prevention and medical management

Scoring system:

- he score ranged from 0 "incorrect" to 1 "correct". The total item score ranged from 0-15 grades and was classified as follows:
- Satisfactory level of patients' knowledge ≥70%).
- Unsatisfactory level of patients' knowledge <70%.

Tool (II)Nurses' assessment tool: It included the following parts:

Part (1): Nurses' Demographic data: it was concerned with demographic characteristics of studied nurses such as age, gender, educational level, years of experience, previous attendance of training courses regarding care of patients with bleeding esophageal varices.

Part (2): Nurses' knowledge assessment questionnaire: It was developed by the investigator in simple Arabic language to assess nurses' level of knowledge after reviewing the related and recent literatures **(Ahrens et al., 2010; Rossian & Crusher, 2017; Hussien et al., 2020; Mohamed et al., 2021)** including; definition, etiology, risk factors, signs and symptoms, diagnostic studies, complications, medical, surgical and nursing management of EVB.

Scoring System:

The score was ranged from 0 "incorrect" to 1 "correct", Total items score was ranged from 0-27 grades and it was categorized as follows:

-
atisfactory nurses level of knowledge ≥90.

-
nsatisfactory nurses level of knowledge <90%.

Part (3) Nurses' practice observational checklist: It was developed by the investigator to assess nurses' level of practice regarding care of patients with bleeding esophageal varices, based on review of recent related literature **(Lynn et al., 2013; Abdelhaleem et al., 2019;Hussien et al., 2020).** It was comprised 5 parts covering the following procedures (Cannula insertion, blood sampling, nasogastric tube insertion and lavage, blood and plasma transfusion).

Scoring System:

- The score was ranged from 0 "done" to 1 "not done", Total items score was from 0-122 grades and it was categorized as follows:
- Satisfactory nurses' level of practice ≥90%).
- Unsatisfactory nurses' level of practice <90%.

Tool (III) Environmental assessment tool:

It was designed by the investigator to analyse environmental factors affecting clinical outcomes among patients with bleeding esophageal varices, such as patient-related factors, which included age, existence of other medical disorders, comorbidities, degree of variceal bleeding, Eating high-risk foods and drinks, Six tiny meals, no exercise, coughing and sneezing, lifting heavy objects, constipation, and lifestyle factors such as drinking alcohol and smoking. Staff nurses' criteria were knowledge and expertise, efficient communication with the healthcare team, and medication administration. The score ranged from 0 ("not available") to 1 ("available").

Tool (IV) Clinical outcomes assessment tool:

It was developed by investigator to assess clinical outcomes of patients with bleeding esophageal varices. It included hemodynamic stability, length of stay, persistent or recurrent bleeding and mortality rate.

Preparatory Phase:

It included reviewing of the recent related literature and theoretical knowledge of various aspects of the study using books, articles, internet, periodicals, and magazines in order to develop and modify the data collection tools.

Pilot Study:

A pilot study was carried out on 10 % of study subjects to test clarity, feasibility and applicability of the data collection tools. The subjects who were included in the pilot study were included in the study sample because no modification was done after conducting the pilot study.

Reliability:

Testing reliability of the proposed tools was done statistically by Cronbach's alpha test reliability of study tools (Cronbach's alpha) = 0.814. It was used to examine whether the questionnaires had internal consistency.

Fieldwork:

Before conducting the study, an approval was obtained from the Scientific Research and Ethical Committee of the faculty of nursing Ain Shams University. Approval was obtained from each participant, the investigator clarified the aim of the study and its implications to the nurses included in the study, They were told that anonymity and confidentiality would be maintained, and they were advised of their right to refuse or withdraw from the study at any time. The study procedures have no negative impact on participants. Data collection began and was completed within three months, commencing in June 2023 and ending in August 2023. The investigator collected data three days a week, in the morning and afternoon shifts. Each nurse filled the used tool , which took around 30 minutes. Patients spent 20-30 minutes to complete Tool I (the patient interview questionnaire), which comprised patient sociodemographics, clinical data, and knowledge. Tool III (Nurses' assessment tool), which included part (1) Nurses' Demographic data and part (2) Nurses' knowledge assessment questionnaire, took 15-20 minutes to fill out by the studied nurses to assess nurses' knowledge of esophageal varices, but part (3) Nurses' practice observational checklist took 45-60 minutes to complete by the investigator. The investigator gathered tools III (environmental assessment tool) and IV (clinical outcomes assessment tool) to examine environmental factors and clinical outcomes, each of which takes around 10 minutes.

Ethical Considerations

Before the study's conduction, ethical approval was obtained from the Scientific Research Ethical Committee of the Faculty of Nursing at Ain Shams University. The subjects were informed about their right to withdraw at any time without giving any reason and the collected data was kept confidential and used for scientific work only. Informal consent was obtained from each participant in the study.

Administrative Design:

Approval to carry out this study was obtained from Faculty of Nursing, Ain Shams University to get permission from the director of mahalla hepatology teaching hospital explaining the purpose of the study to obtain the permission for conducting this study.

IV. Statistical Design:

Data collected from the studied sample was revised, coded and entered using a Personal Computer (PC). Computerized data entry and statistical analysis were fulfilled using the Statistical Package for Social Sciences (SPSS), version 22.0 (SPSS Inc., Chicago, Illinois, USA). Data were presented using descriptive statistics in the form of frequencies, percentages and Mean ± SD, Spearman's rank correlation coefficient, H* kruskal Wallis test, R: Pearson's correlation coefficient and Alpha Cronbach test. A correlation coefficient is a numerical measure of some type of correlation, meaning a statistical relationship between two variables. Not significant at $P > 0.05$, (*) statistically significant at $p<0.05$ and **= High significant $P <0.01$.

Results

Table (1): reveals that the mean of age the studied patients were (64.03±7.68) years, The age distribution was varied, with 46.9% of patients aged between 50 and 70 years, and 41.8% aged over 70 years. Regarding gender, 58.2% were male. A significant portion, 53.1%, had no formal education. In terms of employment, 64.3% were not working, and a majority of 78.6% were from rural areas. The marital status was predominantly married, accounting for 79.6% of the individuals.

Figure (1) Regarding the total level of knowledge of the studied patients, reveals that

(73.5%) of the patients had an unsatisfactory

Table (2): shows that the age distribution shows a significant portion (60.5%) under 30 years, with a mean age of 30.68±3.60 years. The majority of them are male (55.3%). Married nurses make up the majority of the nursing workforce (76.3%). Regarding education, (55.3%) of them held nursing bachelor's degrees. In addition, only (13.2%) of people had training on bleeding esophageal varices, and (60%) of those who had training had it more than five years ago. Roughly (86.8%) of the population also lacked these skills. One-to-five-year and over-10-year experience was held by (28.9%) of them.

Figure (2) Concerning the total level of knowledge of the studied nurses regarding the care of patients with bleeding esophageal varices, indicates that a substantial majority, specifically (76.3%) of them, possessed a satisfactory level of total knowledge.

Figure (3) Regarding level of total practice of the studied nurses as regard care of patients with bleeding esophageal varices, the present knowledge regarding bleeding esophageal varices. study shows that (78.9%) of them had satisfactory level.

Table (3): shows clinical outcomes of the studied patients with

bleeding esophageal varices. Hemodynamic stability was observed in (82.7%) of cases. Regarding the length of the current hospital stay, (86.7%) were admitted for 1-2 days. Among the current admissions, (42.9%) experienced persistent or recurrent bleeding. For those experiencing bleeding, (31.0%) of them had 750-1500ml blood loss. Mental status revealed that (87.8%) were aware, and (12.2%) were unaware. Laboratory investigations showed (86.7%) had normal results. (88.8%) discharged from the hospital, while only (11.2%) died.

Table (4): shows a correlation between nurse's total level of knowledge and practice scores regarding care of patients with bleeding esophageal varices (N=38). The Pearson correlation coefficient (r) between the two scores is 0.319, indicating a significant positive correlation (p=0.037*).

Table 1: Number and percentage distribution of the studied patients regarding their socio-demographic data **(N=98).**

Socio-Demographic Data of patients	No.	%
Age (years)		
30-50 years	11	11.2
50-70 years	46	46.9
>70 years	41	41.8
Mean±SD	64.03±7.68	
Sex		
Male	57	58.2
Female	41	41.8
Academic qualification		
Uneducated	52	53.1
Reads and writes	24	24.5
Diplome	19	19.4
High education	3	3.1
Marital status		
Married	78	79.6
Divorced	3	3.1
Widowed	17	17.3
Occupation		
Employed	35	35.7
Un employed	63	64.3
Residence		
Urban	21	21.4
Rural	77	78.6

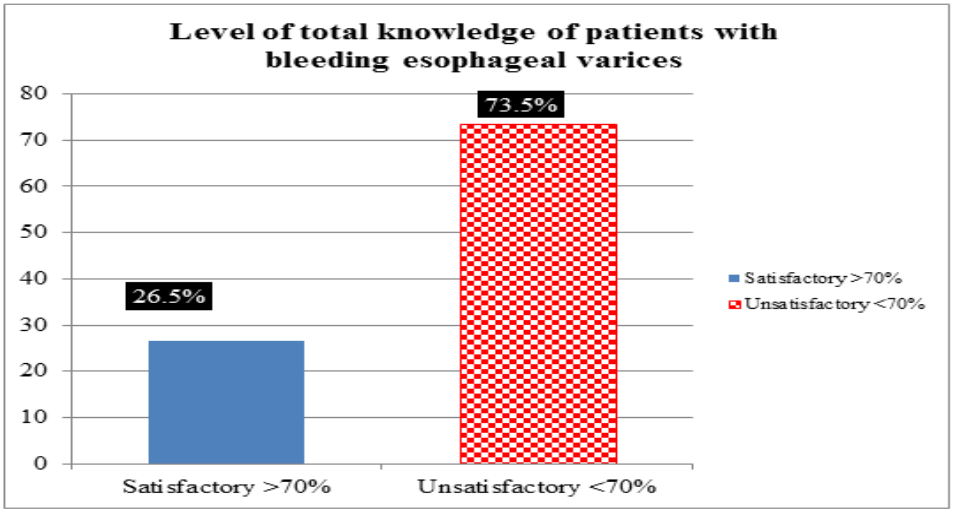

Figure 1 : Percentage distribution of the studied patients total level of knowledge regarding bleeding esophageal varices**(N=98).**

Table 2: Number and percentage distribution of the studied nurses demographic data (N=38).

Demographic Data of nursing	No.	%
Age (years)		
<30 years	23	60.5
30-40 years	11	29.0
>40 years	4	10.5
Mean±SD	30.68±3.60	
Sex		
Male	21	55.3
Female	17	44.7
Marital status		
Single	9	23.7
Married	29	76.3
Academic qualification		
Technical Institute	12	31.6
Bachelor of Nursing	21	55.3
Postgraduate qualifications	5	13.1
Years of Experience		
<1 year	9	23.7
1<5 years	11	28.9
5<10 years	7	18.4
≥10 years	11	28.9
Training course regarding bleeding esophageal varices:		
Yes	5	13.2
No	33	86.8
If yes, How long (n=5)		
1-5 years	2	40.0
> 5 years	3	60.0

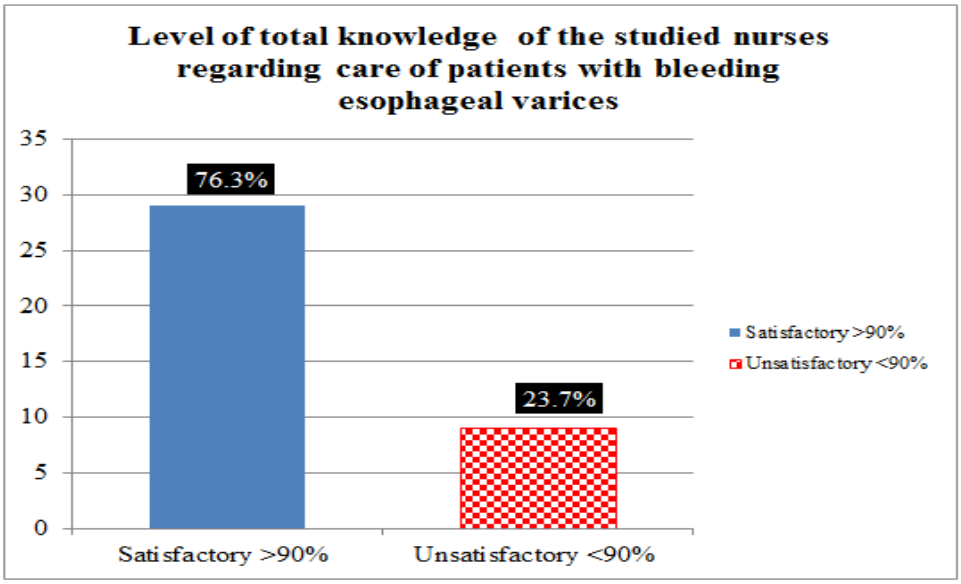

Figure 2 : Percentage distribution of the studied nurses level of total knowledge regarding care of patients with bleeding esophageal varices**(N=38).**

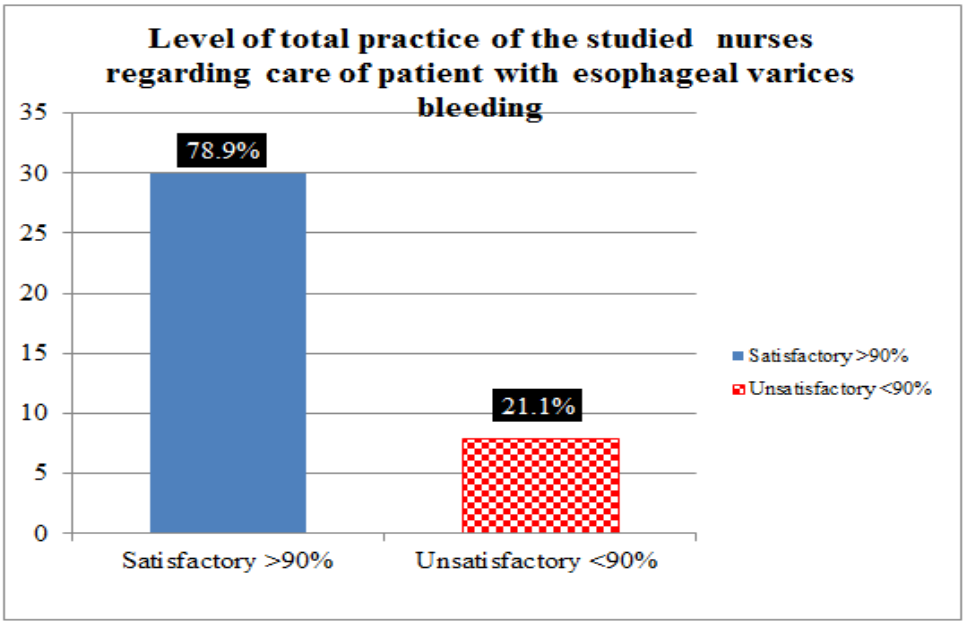

Figure 3: Percentage distribution of the studied nurses total level of practice caring of patient with esophageal varices bleeding **(N=38).**

Table 3: Number and percentage distribution of the studied patient's clinical outcomes **(N=98).**

Clinical outcomes assessment tool	No.	%
Hemodynamic stability		
Stable	81	82.7
Unstable	17	17.3
Length of current stay in hospital "days"		
1-2 days	85	86.7
3-5 days	8	8.2
>5 days	5	5.1
Current admission with persistent or recurrent bleeding		
Yes	42	42.9
No	56	57.1
If yes Amount of bleeding (n=42)		
< 500 ml	7	16.7
500-750 ml	9	21.4
750-1500 ml	13	31.0
1500-2000 ml	6	14.3
> 2000 ml	7	16.7
Mental Status		
Aware	86	87.8
Un Aware	12	12.2
Laboratory investigations		
Normal	85	86.7
Abnormal	13	13.3
Status of patient discharge:		
Discharge	87	88.8
Death	11	11.2

Table 4: Correlation between total score of nurse's knowledge and practice regarding care of patients with bleeding esophageal varices **(N=38).**

		Total score of knowledge	Total score of practice
Total score of knowledge	r p-value N		0.319 0.037* 38
Total score of practice	r p-value N	0.319 0.037* 38	

Discussion

Bleeding esophageal varices is a life-threatening medical condition that often arises as a complication of advanced liver disease, most commonly due to cirrhosis. These dilated blood vessels in the esophagus can rupture, leading to severe and potentially fatal bleeding. Managing patients with bleeding esophageal varices is a complex clinical challenge, and a multitude of factors can significantly influence clinical outcomes in this critical scenario **(Meseeha & Attia, 2023).**

Regarding demographic data of the studied nurses, the current study results illustrated that near two-thirds of the studied nurses' age were less than thirty years old. This finding may be due to that most of nurses in ICU were newly graduated. This result in accordance with **Hussien et al.,(2020)** who conducted a study entitled" Nurses'Performance Regarding Caring for Patients with Esophageal Variceal Bleeding", reported that more than two-fifths of staff age ranged between 25-30 years old.

Concerning gender, more than the half of the studied nurses were males. This finding may be due that ditrubution of male nurses in ICU more than females because of need to more physical effort. This results not matching the result of a study by **Amer et al., (2019)** who conducted a study entitled" Nurses Intervention Regarding Infection Control Measures for Patients with Esophageal Varices During Endoscopy at Zagazig University Hospital",

indicated high percentage of staff nurses were females.

As regard to marital status, more than three-quarters of the studied nurses were married. This finding may be due to increase public awareness toward faculty of nursing. In disagreement with this results, a study by **Abdelhaleem et al., (2019)** who conducted a study entitled" Nurses' Performance Regarding Care of Patients with Bleeding Esophageal Varices", reported that more that three-quarters had diploma in nursing.

As regard to training courses regarding bleeding esophageal varices, the current study presented that the majority of staff didn't attented any training program. This finding may be due hospital didn't conduct educational training courses for staff. This result in consistent with **Abdelhaleemet al.,(2019)** who conducted a study entitled" Nurses' Performance Regarding Care of Patients with Bleeding Esophageal Varices", reported that the majority of staff didn't attend training course .

Concerning patients' total level of knowledge regarding bleeding esophageal varices, the current study result revealed that near three-quarters of the studied patients had unsatisfactory level of knowledge. This finding may be due more than half of studied sample were uneducated so patients with a low education degree typically need more health-related awareness and education. In the same line a finding of a study conducted by **Mohamed et al.,(2021**) who study entitled"Knowledge and Concerns of Patients with Esophageal Varices", reported that the higher percentage of patients had unsatisfactory level of knowledge.

As regard the studied nurses' level of total knowledge regarding care of patients with bleeding esophageal varices, the current study results revealed that more than three-quarters of nurses have satisfactory level of knowledge regarding care of patients with bleeding esophageal varices. This finding may be due frequent exposure to bleeding esophageal varices cases. Also, more than half of staff nurses had bachelor of nursing degree so their basic knowledge was high.

This result consistent with results reported by **Hussien et al., (2020)** in a study entitled" Nurses' Performance Regarding Caring for Patients with Esophageal Variceal Bleeding ", and reported that the majority of nurses had satisfactory level of knowledge about care of patient with bleeding esophageal varices. Also,a study conducted by **Elsayed et al., (2023)** entitled "Efficacy of Educational Bundle on Patients' Clinical Outcomes Post-Esophageal Varices Treatment ",reported acceptable level of patient knowledge regarding bleeding esophageal varices.

This result inconsistent **Mohamed et al., (2021)** who conducted a study entitled" Knowledge and Concerns of Patients with Esophageal Varices", reported unsatisfactory level of nurses' knowledge regarding bleeding esophageal varices with more than the half of nurses had poor level of knowledge. In addition, **Shaban et al., (2019)** who reported unsatisfactory level of nurses' knowledge regarding bleeding esophageal varices.

In relation to total practice of the studied nurses as regard care of patients with bleeding esophageal varices, the current study results revealed that more than three quarters of studied nurses had satisfactory of total practice level regarding care of patients with bleeding esophageal varices. This could be attributed to that most of the studied nurses had bachelor degree in nursing and near half of them had experience more than 5 years. This result is consistent with results reported by **Hussien et al., (2020)** who study entitled" Nurses' Performance Regarding Caring for Patients with Esophageal Variceal Bleeding ",reported that a more than half of staff had satisfactory practice level.

Also, in the same line with the study findings ,a study conducted by **Ibrahim et al.,(2021)** entitled "Nurses' performance regarding care of upper gastro intestinal bleeding patients undergoing upper endoscopy ",reported that more than three quarters of nurses had satisfactory practice level. In disagreement with this results, a study by **Abdelhaleem et al., (2019)** who conducted a study entitled" Nurses' Performance Regarding Care of Patients with Bleeding Esophageal Varices", and reported that more than the half of the studied nurses have low level of performance regarding care of patients with bleeding esophageal varices.

Concerning patient's clinical outcomes, the present findings revealed that the majority of patients were discharged from hospitals. This

finding may be due to emergency and professional management of cases. This result in agreement with **Lu et al., (2020)** entitled" Second urgent endoscopy within 48-hour benefits cirrhosis patients with acute esophageal variceal bleeding", presented that mortality of patients were discharged from hospital . Also, a study conducted by **Zullo et al., (2021)** entitled "Clinical outcomes in cirrhotics with variceal or nonvariceal gastrointestinal bleeding: A prospective, multicenter cohort study", indicated that most of patients were discharged from hospital.

As regard Correlation between total score of nurse's knowledge and practice regarding care of patients with bleeding esophageal varices, the current study results revealed that there was a significant positive correlation between total score of nurse's knowledge and practice regarding care of patients. This finding may be due to logic correlation as knowledge serve as the backbone for any practice and support it to be an evidence-based practice.

This result was suppoterd with **D'Amico et al., (2018)** who entitled" Hepatic vein pressure gradient reduction and prevention of variceal bleeding in cirrhosis: a systematic review", indicated a significant positive correlation between total score of nurse's knowledge and practice regarding care of patients. Also, in agreement with these findings ,a study conducted by **Amer et al.,(2019)** entitled "Nurses Intervention Regarding Infection Control Measures for Patients with Esophageal Varices During Endoscopy at Zagazig University Hospital ", and indicated that there was improvement of knowledge and improvement of practice of the nurses.

Conclusion

Based on findings of the current study it can be concluded that , the majority of the studied patients displayed a deficient knowledge regarding bleeding esophageal varices. However, most nurses showed an adequate level of knowledge and practical skills in managing patients with this condition. There was a notable direct correlation between the nurses' knowledge levels and their practical care skills. Several key factors were identified as significant predictors of patient outcomes, including the academic qualifications of the nursing staff, the level of patient and nurse knowledge, the practical application of nursing care, environmental considerations, and factors specific to patients.

Recommendations

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

1-
ontinuous evaluation of nurses' knowledge and practice is essential to identify their needs in ICU regarding assessment and prevention of EVB: Ongoing education and evaluation can directly improve patient care and outcomes.

2-
egular follow-ups for all the studied patients to evaluate their health conditions and detect complications early: This ensures continuous patient care and early detection of issues, which is critical for patient outcomes.

3-
n-going regular educational and training programs to study patients to improve their knowledge about bleeding esophageal varices: Education is critical, but it is a longer-term strategy compared to direct patient care.

4-
uture research should be conducted to examine ICU nurses' knowledge and practices before and after the implementation of an educational program regarding care of EVB patients: This would assess the effectiveness of educational programs and could lead to improved care.

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