

Effect of Secondary Prevention Educational Guidelines on Patients' Clinical Outcomes Post Endoscopic Ligation of Esophageal Varices

Naglaa Elsayed Mahdy¹, Asmaa Mohamed Khorais² Ramy Samir Abdelhamid³

¹Assistant Professor of Medical Surgical Nursing,

²Lecturer of Medical Surgical Nursing , Faculty of Nursing Ain Shams University, and

³ Lecturer of Internal Medicine of Gastroenterology & Hepatology, , Faculty of Medicine, Ain Shams University, Egypt.

Corresponding Author: Anglia Essayed Mandy

Abstract: Esophageal Variceal bleeding (EVB) is a life-threatening condition that requires a team approach with defined stepwise management post endoscopic ligation. Role of the nurse is essential in raising awareness and providing education as a secondary prevention for promoting the patients' health and prevents complications.

Aim: This study aimed to evaluate the effect of secondary prevention educational guidelines on patients' clinical outcomes post endoscopic ligation of esophageal varices. **Study design:** A quasi experimental design was utilized.

Subject: A purposive sample of 100 patients with esophageal varices after endoscopic ligation. The study subjects were divided equally into two groups (study and control group). **Setting:** The study was conducted at El-demerdah hospital /Cairo/Egypt. **Data collection tools:** 1) Interview questionnaire, 2) Patients' clinical outcomes assessment tool. **Results:** The present study revealed that, there were no statistically significant differences between two groups regarding satisfactory level of knowledge and their clinical outcomes pre-guidelines intervention. While, there were statistically significant differences between two groups post- and follow up guidelines intervention regarding knowledge, means of Hg and RBCs and fatigue. Moreover, there were statistically significant differences between two groups follow up guidelines intervention regarding means of all vital signs except diastolic blood pressure, readmission and recurrent bleeding. **Conclusion:** Application of secondary prevention guidelines had significant positive effect on clinical outcomes of patients after endoscopic ligation of esophageal varices at follow up. **Recommendations:** Further researches are replication of the current study on a larger probability sample is recommended to achieve generalization of the results and wider utilization of the designed secondary prevention educational guidelines.

Keywords: Clinical outcomes, Endoscopic ligation, Esophageal varices, Secondary prevention guidelines,

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I. Introduction

Esophageal varices are engorged and distended blood vessels of the esophagus. These varices develop as a result of portal hypertension that is most commonly caused by primary liver disease, liver trauma, or thrombosis of the splenic or portal veins, which result in damage to the liver sinusoids. Without adequate sinusoid function, resistance to portal blood flow is increased, and pressures within the liver are elevated. This leads to increased portal venous pressure (portal hypertension), causing collateral circulation to divert portal blood from areas of high pressure within the liver to adjacent areas of low pressure outside the liver, such as into the veins of the esophagus, the spleen, the intestines, and the stomach. The tiny, thin-walled vessels of the esophagus and proximal stomach that receive this diverted blood lack sturdy mucosal protection. The vessels become engorged and dilated, forming esophagogastric varices that are vulnerable to damage from gastric secretions and that may result in subsequent rupture and massive hemorrhage (Urden, Stacy and Lough, 2014; Jones and Fix, 2015).^{[1], [2]}

Esophageal Variceal bleeding (EVB) is a life-threatening condition that is characterized by acute, massive bleeding. It results in hypovolemic shock, initiation of the shock response, and development of multiple organ dysfunction syndrome if left untreated. However, the risk of variceal bleeding increases with disease severity and variceal size, not intractable hypovolemic shock. The overall, bleeding occurs in 25% to 30% of patients within 2 years of diagnosis, and 20% to 30% mortality from each bleeding episode (Cat and Liu-DeRyke, 2010; Goldman and Schafer, 2012; Huang, 2012).^{[3], [4], [5]}

Esophageal variceal bleeding is the commonest cause of acute upper gastrointestinal bleeding in Egypt. It represents a catastrophic consequence of portal hypertension due to high prevalence of schistosomiasis and viral hepatitis with high incidence of morbidity and mortality despite modern therapeutic modalities making a major public health problem in Egypt. It accounts for 75% of all upper gastrointestinal bleeding (UGIB) and responsible for 20% of deaths among Egyptian patients between the ages of 35 to 75 years, while in the Western countries it accounts for 30% of all upper gastrointestinal bleeding (*Sallam 2007 ; Williams and Hopper, 2011*).^{[6], [7]}

Factors that contribute to EVB 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 EVB (*Williams and Hopper, 2011; White, Duncan and Baumle 2013*).^{[7] [8]}

Medications like NSAIDs that erode the esophageal mucosa or interfere with cell replication also may contribute to bleeding, NSAIDs usage is said to be the second most common etiologic factor for causing GI bleeding and are frequently used in higher doses for various conditions such as acute and chronic pain, aspirin is used in smaller doses to prevent cardio-vascular events for its antiplatelet effect. Some commonly used NSAIDs are diclofenac, ibuprofen, piroxicam, naproxen, and indomethacin (*De Berardis, Lucisano and D'Ettore., 2012*).^[9]

Treatment of these patients is usually complex and requires a team approach with defined stepwise management. The management of acute variceal hemorrhage is difficult and need a collaboration of multi-disciplinary team including the nurse, the physician and surgeon who may be in a powerful position to positively help such patients to adapt to life and minimizing the associated complications. Endoscopic therapy is a key aspect, but pharmacological treatment with vasopressors and antibiotic treatment are also important components of successful patient care. The management of those patient focuses on hemodynamic stabilization, identification of the bleeding site, and initiation of definitive endoscopic intervention to control or stop the bleeding. Measures to decrease anxiety in this patient population are also indicated due to the severity and sudden onset of GI bleeding (*Opio and Garcia-Tsao, 2011; Burns, 2014*).^{[10], [11]}

The initial treatment priority of variceal bleeding is the restoration of adequate circulating blood volume to treat or prevent shock. This is accomplished with the administration of intravenous infusions of crystalloids, blood, and blood products. Blood transfusion is given in order to obtain a haemoglobin level between 7 and 8 g/dl. A restrictive blood transfusion is associated with a reduction in further bleeding and re-bleeding, a reduction in complication rate, and increased survival. Hemodynamic monitoring can help guide fluid replacement therapy, particularly in patients at risk for heart failure. Supplemental oxygen therapy is also initiated to increase oxygen delivery and improve tissue perfusion (*Jairath and Barkun, 2011; Yoshida, 2012*).^{[12], [13]}

Control of bleeding in acute variceal hemorrhage, may be accomplished through the use of pharmacologic agents and endoscopic therapies. It has been showed by several randomized controlled trials and meta-analysis of these trials that combined therapy (vasoactive drugs and endoscopic therapy) is more effective than either treatment alone. Intravenous somatostatin, and octreotide can reduce portal venous pressure and slow variceal hemorrhage by constricting the splanchnic arteriolar bed (*Cremers and Ribeiro, 2014*).^[14]

Therapeutic endoscopy is considered the definitive treatment for active variceal hemorrhage. Endoscopic variceal ligation (EVL) is the preferred therapy as it provides better bleeding control and has fewer adverse events compared sclerotherapy. Endoscopic injection sclerotherapy (EIS) is used when band ligation is technically difficult (for example, when there is too much blood for good visibility) or not available. Sclerotherapy is less expensive than band ligation. During EVL, bands are placed around the varices to create an obstruction to stop the bleeding. Complications include bleeding ulcers and esophageal perforation; systemic complications are rare (*Amitrano et al., 2012*).^[15]

Endoscopic injection sclerotherapy controls bleeding by the injection of a sclerosing agent in or around the varices. This creates an inflammatory reaction that induces vasoconstriction and results in the formation of a venous thrombosis. Complications include bleeding ulcers, esophageal perforation, stricture formation, and pleural effusions; systemic complications such as aspiration pneumonia and spontaneous bacterial peritonitis have also been reported. If these initial therapies fail, trans-jugular intrahepatic porto-systemic shunting (TIPS) may be necessary. In a TIPS procedure, a channel between the systemic and portal venous systems is created to redirect portal blood, thereby reducing portal hypertension and decompressing the varices to control bleeding (*Garcia-Pagán et al., 2010*).^[16]

Variceal recurrence and re-bleeding is higher after EBL compared with injection sclerotherapy. This can be explained by the fact that EBL is a local mechanical method of variceal obliteration and does not decrease portal pressure. That is why the EBL effect is of limited duration and has no effect on other complications of portal hypertension. Also, this observation can be explained by the fact that EBL only achieves the eradication of the varices in the mucosal and submucosal layers, leaving untouched the perforating veins, which join the

submucosal vascular channels to collateral veins (*Mönkemüller, Wilcox and Muñoz-Navas, 2010 ; Dell'era and Bosch 2013*).^{[17], [18]}

Despite the reduction of mortality due to variceal bleeding, the recurrence rate of esophageal varices remains high. A six-week re-bleeding rate is approximately 17% and the mortality rate of an episode of esophageal variceal bleeding is 20%. Because of high rates of variceal recurrence, re-bleeding and related mortality all cirrhotic patients should be screened for esophageal varices at different intervals according to the presence and size of the varices. Once large varices have developed, the patients should be treated to prevent bleeding (*Mašalaitė, Valantinas and Stanaitis, 2012; Woodruff, 2016*).^{[19], [20]}

The concept of prevention aimed at eradicating, eliminating or minimizing the impact of disease and disability, or if none of these are feasible, retarding the progress of the disease and disability. The concept of prevention is best defined in the context of levels, traditionally called primary, secondary and tertiary prevention. Role of the nurse is essential in raising awareness and providing education through all levels of prevention for promoting the patients' health. Successful prevention depends upon: a knowledge of causation, dynamics of transmission, identification of risk factors and risk groups, availability of prophylactic or early detection and treatment measures, an organization for applying these measures to appropriate persons or groups, and continuous evaluation of and development of procedures applied (*Kemppainen, Tossavainen & Turunen, 2014 ; Bastable, 2013*).^{[21], [22]}

Primary prevention can be defined as the action taken prior to the onset of disease, which removes the possibility that the disease will ever occur. It signifies intervention in the pre-pathogenesis phase of a disease or health problem. Primary prevention may be accomplished by measures of "Health promotion" and "specific protection". Primary prevention may be accomplished by measures designed to promote general health and well-being, and quality of life of people or by specific protective measures (*Center for Disease Control and Prevention, 2013*).^[23]

Secondary prevention is defined as "action which halts the progress of a disease at its incipient stage and prevents complications." The specific interventions are: early diagnosis (e.g. screening tests, and case finding programs...) and adequate treatment. Secondary prevention attempts to arrest the disease process, restore health by seeking out unrecognized disease and treating it before irreversible pathological changes take place. To facilitate that process, appropriate information must be given for those patients through an educational intervention. Nurses have a key role in providing that information in the form of health teaching. Educational nursing guidelines is the method of assisting patients to resume self-care. Also, when patients were encouraged to participate in their own self-care, knowledge increases and anxiety decreases. Guidelines can improve the quality and consistency of care while the patient is still in the hospital. Patient teaching should focus on the disease, how to manage it and importance of follow up to prevent complications (*vastavi, karmalani, petrucka, 2016*).^[24]

Mersal & Aly 2014^[25] highlight the nurse's role in the delivery of health promotion is to give particular attention on prevention at primary, secondary and tertiary levels. Nurses have a wealth of skills and knowledge and use this knowledge to empower people to make lifestyle changes and choices. This encourages people to take charge of their own health and to increase feelings of personal autonomy. Moreover, Based on the findings of previous studies, it was found that most of patients with esophageal variceal bleeding had lack of knowledge regarding different factors aggravating the risk of bleeding. Hence, all efforts should be directed toward providing those patients with a comprehensive instruction to prevent re-bleeding as a vital part of secondary prevention (*Abd Elkader, Sebaee and El Sayed, 2014*).^[26]

1.1 Significance of the study:

Esophageal varices result from portal hypertension and develop in most patients with advanced cirrhosis. Acute variceal hemorrhage is a significant cause of morbidity and mortality in cirrhotic patients and places huge requirements, both social and economic, on health system resources. The management of acute variceal hemorrhage is difficult and need a collaboration of multi-disciplinary team including the nurse, the physician and surgeon who may be in a powerful position to positively help such patients to adapt to life and minimizing the associated complications. After controlling the acute variceal bleeding episode, the main problem remains as follows: re-bleeding and recurrence of varices after endoscopic treatment. The treatment of esophageal varices requires a good outcome with no recurrence what is very important in the long-term management of patients with portal hypertension. Comprehensive supportive care and educative self-care through implementing secondary preventive care guidelines from staff can enhance the patient's ability to cope with his/her condition and minimizing complications. Nursing has the prerogative to be the team that is closest to and actively participates in treatment in its different phases. Nurses play an important role in the assessment of patients' needs and teach them to have better outcomes, living longer and enjoy a high QoL. However, there is a lack of national and international studies investigating or evaluating the effect of nursing intervention of implementing secondary preventive care guidelines on patients' outcomes. Therefore, this study was conducted to assess the effect of secondary prevention educational guidelines on patients' outcomes after endoscopic ligation.

1.2 Aim of the study:

This study aimed to evaluate the effect of secondary prevention educational guidelines on patients' clinical outcomes post endoscopic ligation of esophageal varices through the following:

- 1- Assess of patients' knowledge pre- secondary prevention guidelines intervention.
- 2- Develop and implement the secondary prevention educational guidelines based on patients' learning needs assessment.
- 3- Evaluate the effect of secondary prevention educational guidelines on patients' knowledge post- guidelines intervention.
- 4- Evaluate the effect of secondary prevention educational guidelines on patients' clinical outcomes post guidelines intervention.

1.3 Research hypothesis:

The current study hypothesized that:

1. The study group will have an improvement regarding patients' knowledge post implementation of secondary prevention educational guidelines compared to the control group.
2. The study group will have better clinical outcomes post implementation of secondary prevention educational guidelines compared to the control group.
3. There will be a statistically significant difference between the study and control group regarding patients' clinical outcomes post implementation of secondary prevention educational guidelines.

1.4 Operational definitions:

Secondary prevention educational guidelines: It is the basic information needed for patients with bleeding esophageal varices after endoscopic band ligation. It covered the following items: disease definition, causes, signs and symptoms, management methods and factors associated with recurrence of bleeding; and instruction post-endoscopy (as bed rest, eating pattern, medication, follow up schedule; lifestyle modification; prevention and management of patients' complications regarding to esophageal varices as: fatigue, dysphagia, and anemia).

Clinical outcomes: Outcomes measured based on comparisons between both groups (study & control) regarding outcomes measures included the patient's knowledge, patients' vital signs (included temperature, pulse, respiration rate, blood pressure and pain intensity), results of laboratory tests (included Hg, RBCs, WBCs, blood urea and Albumin), patients' fatigue, early recurrence of bleeding esophageal varices after endoscopic band ligation and re-admission.

II. Methods

2.1 Research design:

A quasi experimental design was used to achieve the aim of the present study.

2.2 Setting:

The study was conducted in the Gastrointestinal Endoscopic Care Unit at EL-Demerdash University Hospital /Cairo/ Egypt.

2.3 Subjects:

A purposive sample composed of 100 adult patients from both sex, newly diagnosed with esophageal varices and undergoing endoscopic band ligation for the first time. They were recruited from the above mentioned setting, 50 of them (control group) who received routine care, while other 50 (study group) who received both of the routine care and the secondary prevention educational guidelines. Inclusion Criteria: Adult (≥ 18 -years old), patients willing to participate, fully conscious, admitted to hospital with first time bleeding due to esophageal varices, able to communicate and hemodynamic stable, and free from others chronic diseases. Patients in the second day after endoscopic band ligation and never had been any educational program about the disease and its management. *Exclusion criteria:* Patients with hepatocellular carcinoma or advanced liver cell failure and sever portal hypertension. Patients have comorbid disease as (Renal impairment) and patients with disturbed level of consciousness /or mental disorders. The sample size was determined statistically by power analysis considering the total number of patients who undergoing esophageal endoscopic band ligation. The calculation was done considering the following: Type I error with significant level (α) = 0.5, Type II error by power test (1-B) = 90% and Found the minimum sample size was 100 patients.

2.4 Tools for data collection:

2.4.1 Interview questionnaire for patients esophageal varices,:

It was designed by the researcher and written in simple Arabic language after reviewing the related literatures: *Pottage, 2012; Pellico, 2013 ; William & Hoppert, 2013 ; Burns, 2014 ; Snelling, 2014; Lewis et al 2016* [27], [28], [7], [11], [29], [30]. It composed of two parts. **The 1st part:** It was concerned with characteristics of patients under study which include, age, gender, educational level, residence, marital status, work type, active smoking, and passive smoking. **The 2nd part:** was used to assess patients' learning needs regarding esophageal varices, its management and complications. It was consisted of 45 questions (6 MCQ questions and 39 true & false questions). It covered the following items, knowledge about esophageal varices and causes (3 MCQ questions), endoscopic ligation (3 MCQ questions), bleeding risk factors (8 true & false questions), diet (15 true & false questions), and complications (16 true & false questions).

Scoring system : One grade was given for the correct answer and zero for the incorrect answer, with total grades = 45 grades. The total level of patients' knowledge score was categorized as follows: Satisfactory level $\geq 75\%$ (≥ 34 grades) and Unsatisfactory level $< 75\%$ (< 34 grades).

2.4.2 Patient's Clinical outcome assessment tool:

This tool was adapted from *Sheb, Mohamed, and Othman, 2013 and Khalil, et al 2015* [30], [31] and modified by the researcher based on the literature: *Morton and Fontaine, 2013 ; Sharon et al., 2014 ; Urden et al., 2014 ;; Hall, Schmidt and Kress, 2015* [33], [34], [1], [35]. It was used to assess patient's clinical outcomes after esophageal endoscopic ligation and comparison was done between the control and study group pre, post and follow up of the secondary prevention guidelines implementation. It divided into four parts. The first part was concerned with patients' vital signs (included temperature, pulse, respiration rate, blood pressure and pain intensity). The second part was concerned with patients' laboratory tests results (included Hg, RBCs, WBCs, blood urea and Albumin). The third part was concerned with assessment of patients' readmission, recurrent bleeding and presence of hematemesis, melena and syncope. The fourth part was concerned with assessment of patients' fatigue. This tool was written in English language to cover all parts except the fourth part concerned with patients' fatigue which was written in Arabic Language. Fatigue Impact Scale was used to assess patients' fatigue, it was adopted from *Amer et al., 2009 and Ghajarzadeh, 2012* [36], [37] and translated into Arabic language and back translated to English and it was consisted of 21 statements with patients' fatigue

Scoring system: Regarding patients' vital signs and laboratory results, the actual numerical values were recorded and then their means were calculated. Regarding patients medical co-morbidities, readmission and recurrent bleeding, the response of Yes or No were used and One grade was given for (yes) response while zero for (no) response. Finally, regarding the scoring of Fatigue Impact Scale, the responses for the twenty one statements were as follows: Never (0) rarely (1), sometimes (2), often (3) and always (4) and its total score was 84 considering that the lower score was reflecting the minimal level of fatigue. It was categorized as follows: $< 50\%$ (< 42 grades) was mild fatigue, $-50\% \leq 75\%$ (from 42 to 63 grades) was moderate fatigue and $>75\%$ (>63 grades) was severe fatigue

2.5 Secondary prevention educational guidelines for patients with esophageal varices:

It were designed by the researcher and written in simple Arabic language using illustrated pictures based on related recent literatures: *Ignatavicius and Workman, 2012 ; Lewis, et al. 2014 ; Snelling, 2014: Timy and Smith, 2014 ; Linton, 2016* [38], [30], [29], [39], [40]. It included the basic information needed for patients with bleeding esophageal varices after endoscopic band ligation as. It covered the following items: disease definition, causes, signs and symptoms, management methods and factors increase incidence of disease; and instruction post-endoscopy (as bed rest, eating pattern, timing, medication timing, follow up schedule; lifestyle modification; patient complication regarding to esophageal varices as: fatigue, dysphagia, and anemia. Secondary prevention educational guidelines were revised by a group of five experts in medical surgical nursing and two experts in medicine at El-demerdash Hospital for content validity. Based on the opinion of experts some modifications were done, and then the final form was developed.

2.5 Content validity and reliability: Content validity were ascertained by a group of 4 experts from medical surgical nursing department, Faculty of Nursing, Ain shams university and 3 experts in Internal Medicine of Gastroenterology & Hepatology, Faculty of Medicine Ain shames universty. The aim was to determine relevance, clarity, completeness, simplicity and applicability of the study tools, experts responses were either agreed or disagreed or agreed with modifications for the face and content validity. About 85% or more of the experts were in agreement with the proposed tool. Required modifications were done. The modifications were focused on some statements of interview questionnaire. Testing reliability of the proposed tools was done statistically by Alpha Cronbach test which was 0.91 for the interview questionnaire and 0.951 for Patients' clinical outcome assessment tool with $p=0.01$.

2.6 Ethical considerations: The ethical considerations in this study included the following: The researcher clarified the objectives and the aim of the study to patients included in the study. The researcher maintains an anonymity and confidentiality of patients' data. Patients were allowed to choose to participate or not and they were informed that they have the right to withdraw from the study at any time without giving any reason.

2.7 Pilot study: A pilot study was conducted on 10 % of subjects (10 patients) to test the applicability and feasibility of the study tools as well as time needed to fill this tool. Obtained results used as a guide to reconstruct the changes needed in the data collection tools and those subjects were excluded from the study sample.

2.9 Field work:

Field work included two phases: implementation phase and evaluation phase.

2.9.1 Implementation phase:

The collection of data and application of the secondary prevention educational guidelines lasted over a period of twelve months, starting at March 2016 and ending in March 2017. For the control group, data collection started from the beginning of March 2016 to June 2016. While for the study group the data collection and application of the secondary prevention educational guidelines started from the beginning of July 2016 to March 2017. Data were collected in the following manner:

The researcher visited the endoscopic unit in Saturday, Monday, and Wednesday during morning shifts (9.00 am to 12.00 pm). For both groups, first, the researcher greeted the patients, introduced herself and purpose of study was explained by the researchers to patients who agreed to participate in the study prior to any data collection. The researcher took the patients' telephone number at the first contact (During hospitalization) to determine the second and third appointments in order to complete data collection process. Collection. The first 50 patients were selected to be a control group, while the second 50 patients were selected to be a study group. The researchers started the process of data collection with control group. Every subject was interviewed individually at endoscopic unit. The researchers filled in the data collection tools with the patients at three intervals, immediately after endoscopy, then after one month and after three months from the initial assessment. Pre assessment involved assessment of patients' demographic characteristics, clinical data and knowledge regarding secondary prevention guidelines after endoscopic ligation of esophageal varices. Filling the tools took about 55-60 minutes distributed as the following: interview questionnaire took about 30 minutes and patient's clinical outcome assessment tool took about (25) minutes.

After completing data collection from control group, the researchers started to develop secondary prevention educational guidelines based on patients' needs and reviewing of the related literature. It was developed in an Arabic language and suitable for all patients regardless to their educational level. The researchers start assessment of study group at July 2016. Regarding study group, the pre assessment was done also as control group and took approximately same time for all data collection tools, after that, secondary prevention guidelines were implemented for each patient separately according to patients' learning needs. Then, the sessions of secondary prevention educational guidelines were conducted. secondary prevention guidelines were explained to the patients by the researcher individually. Number of sessions based on patients' needs which ranged between 3-4 sessions. Each session lasted approximately 30-40 minutes after explanation of the objectives of each session.

2.9.2 Evaluation phase:

This phase included evaluation of the effect of secondary prevention guidelines on knowledge and clinical outcomes of patients with esophageal varices after endoscopic ligation by comparing the results pre, post and follow up of the self-care guidelines implementation by using the same data collection tools which were done to the control and study groups. Pre-assessment was done before secondary prevention guidelines implementation at endoscopy unit, while Post-assessment was done after one months and follow up-assessment was done after 3 months of endoscopic ligation. Post- and follow up-assessment were done at outpatient Clinic.

2.9 Data analysis:

The collected data were organized, analyzed using appropriate statistical significant tests. The data were collected, coded and entered to a personal computer (PC), IBM compatible 2.6 GHZ. The data were analyzed with the program using the statistical package for social science (SPSS) under windows version 11.0.1. Numerical data (quantitative) were presented as mean and standard deviation (SD) values. Qualitative data were presented as frequencies (n) and percentages (%). Independent-samples t-test of significance was used when comparing between two means, satisfactory The tests were used to summarize data were range, mean, standard deviation, t- test and chi-square-test were used to compare scores for numerical data. Pearson correlation coefficient is used for quantitative variables Also, Alpha Cronbach was used to test reliability

of tools and factor analysis to test its validity. Also test of significance was as follows: Non significant (NS) when $P > 0.05$; Significant(S) when $P < 0.05$ and Highly Significant (HS) when $P < 0.01$

III. Results

Table (1): Demographic characteristics of patients in the control and the study group.

Patients' Characteristics	Control Group (n=50)		Study Group (n=50)		Test	P value
	No	%	No	%		
Age/years						
40 – 49	9	18.0%	11	22.0%	1.22	0.5425
50 – 59	31	62.0%	31	62.0%		
60 or more	10	20.0%	8	16.0%		
Mean ± SD	55.52 ± 4.37		55.64 ± 4.11		T= 0.14	0.887
Gender						
Male	28	56.0%	23	46.0%	1.00	0.317
female	22	44.0%	27	54.0%		
Education						
Illiterate	20	40.0%	17	34.0%	1.17	0.5558
Read and write	17	34.0%	15	30.0%		
Secondary	13	26.0%	18	36.0%		
Residence						
Rural	33	66.0%	29	58.0%	0.68	0.409
Urban	17	34.0%	21	42.0%		
Marital status						
Widow & divorced	10	20.0%	21	42.0%	6.42	0.0403
Married	39	78.0%	27	54.0%		
Single	1	2.0%	2	4.0%		
Work type						
Does not work	17	34.0%	14	28.0%	1.10	0.294
House wife	17	34.0%	20	40.0%		
Employee	5	10.0%	8	16.0%		
Worker	11	22.0%	8	16.0%		
Active smoking						
Yes	29	58.0%	30	60.0%	0.04	0.838
No	21	42.0%	20	40.0%		
Passive smoking						
Yes	15	30.0%	20	40.0%	1.10	0.294
No	35	70.0%	30	60.0%		

Regarding demographic characteristics of patients in the control and study group, table 1 shows that, the mean age of control group was 55.52 ± 4.37 , while, the mean age of the study group was 55.64 ± 4.11 . Regarding gender, 56.0 % of patients of control group and 46.0 % of patients of the study group were males. As regards educational level, only 40.0% of the control group and 34.0% of the study group were illiterate. In relation to residence, 66.0% and 58.0% of patients in the control and study group resided in rural areas respectively. Regarding marital status, 78.0% of the control group and 54.0% of the study group were married. Finally, concerning smoking, 58.0 % of patients of control group and 60.0 % of patients of the study group were active smokers. Also, there were no statistically significant differences between two groups regarding their demographic characteristics.

Table (2): Difference between patients in the control and the study group regarding their satisfactory level of knowledge pre-, post- and follow up guidelines intervention.

Items	Patients' satisfactory level of knowledge				χ^2	P
	Control group(n=50)		Study group (n=50)			
	N	%	N	%		
Knowledge about disease and causes						
Pre	0	0.0%	0	0.0%	Equal	-----
Post	0	0.0%	5	10.0%	2.29	0.02178
Follow up	0	0.0%	14	28.0%	4.03	0.00005
Knowledge about treatment methods						
Pre	0	0.0%	0	0.0%	Equal	-----
Post	0	0.0%	9	18.0%	2.67	0.00766
Follow up	0	0.0%	33	66.0%	7.02	0.00000
Knowledge about causative factor						
Pre	0	0.0%	0	0.0%	Equal	-----
Post	0	0.0%	10	20.0%	1.01	0.31488
Follow up	0	0.0%	12	24.0%	2.04	0.04123
Patient knowledge about diet						

Pre	0	0.0%	0	0.0%	Equal	-----
Post	1	2.0%	23	46.0%	5.47	0.00000
Follow up	6	12.0%	38	76.0%	6.45	0.00000
Patient knowledge about complications						
Pre	1	2.0%	1	2.0%	Equal	-----
Post	3	6.0%	43	86.0%	8.03	0.00000
Follow up	5	10.0%	50	100.0%	9.05	0.00000
Patients' total knowledge						
Pre	0	0.0%	0	0.0%	Equal	-----
Post	0	0.0%	27	54.0%	3.69	0.00000
Follow up	0	0.0%	39	78.0%	8.00	0.00000

Table 2 shows that 0% of the study and control group had satisfactory level of total knowledge pre-guidelines intervention. Also, 0% of the control group had satisfactory level of total knowledge post- and follow up guidelines intervention. In contrast 54% and 78% of the study group had satisfactory level of total knowledge post- and follow up guidelines intervention respectively. Also, there were no statistically significant differences between two groups regarding satisfactory level of total knowledge pre-guidelines intervention. While, there were statistically significant differences between two groups post- and follow up guidelines intervention regarding total knowledge and the sub items.

Table (3): Difference between patients in the control and the study group regarding means of vital signs pre-, post- and follow up guidelines intervention.

Vital signs		Control group		Study group		t test	P Value
		Mean	SD	Mean	SD		
Pulse	Pre	87.14	15.24	85.7	17.68	1.75	0.24562
	Post	75.26	14.78	77.94	9.11	1.09	0.27786
	Follow-up	83.9	13.68	73.78	6.72	4.70	0.00001
Respiratory rate	Pre	21.94	3.70	22.08	3.60	0.19	0.84825
	Post	20.82	2.78	20.46	2.58	0.67	0.50337
	Follow-up	21.26	2.72	19.64	2.02	3.38	0.00105
Temperature	Pre	36.998	0.32	37.034	0.43	0.48	0.63426
	Post	37.46	0.38	37.056	0.45	0.12	0.90409
	Follow-up	37.86	0.67	36.976	0.25	2.95	0.00399
Systolic. blood pressure.	Pre	108.3	16.59	104.5	15.85	1.17	0.24437
	Post	109.7	15.50	111.3	10.96	0.60	0.55260
	Follow-up	105.1	15.67	114.9	9.05	1.88	0.04371
Diastolic. blood Pressure	Pre	70.7	9.15	71	9.64	0.16	0.87348
	Post	70.9	9.02	72	8.86	0.62	0.53989
	Follow-up	71.4	8.87	75.3	8.24	1.11	0.26985
Pain. Intensity	Pre	3.80	2.08	4.04	2.08	0.67	0.41422
	Post	3.00	1.64	2.48	1.30	0.04	0.83755
	Follow-up	3.30	1.56	1.60	1.14	13.28	0.00027

Table 3 shows that there were no statistically significant differences between the study and control group regarding means of all vital signs pre- and post-guidelines intervention. While, there were statistically significant differences between the two groups regarding means of all vital signs follow up guidelines intervention except diastolic blood pressure.

Table (4): Difference between patients in the control and the study group regarding means of laboratory data pre-, post- and follow up guidelines intervention.

Laboratory data:		Control group		Study group		t test	P Value
		Mean	SD	Mean	SD		
Hemoglobin	Pre	9.414	0.97	9.542	0.73	0.75	0.45568
	Post	9.63	0.80	9.942	0.57	2.24	0.02750
	Follow-up	9.69	0.77	9.992	0.84	2.06	0.02261
RBCs	Pre	4.726	0.35	4.842	0.25	1.09	0.84825
	Post	4.556	0.33	4.876	0.22	2.16	0.03358
	Follow-up	4.762	0.33	4.884	0.21	2.20	0.03027
WBCs	Pre	7.542	1.54	8.158	1.75	1.87	0.06500
	Post	7.578	1.31	8.282	1.56	2.44	0.01640
	Follow-up	7.95	1.58	8.192	1.28	0.84	0.40228
BL.Urea	Pre	7.838	1.63	7.64	1.78	0.58	0.56283
	Post	7.902	1.57	7.592	1.73	0.94	0.35115
	Follow-up	7.684	1.58	7.128	1.21	1.97	0.05119
Albumin	Pre	3.556	0.27	3.568	0.30	0.21	0.83361
	Post	3.568	0.26	3.676	0.35	1.76	0.08209
	Follow-up	3.556	0.23	3.668	0.33	1.98	0.05098

Table 4 shows that there were no statistically significant differences between the study and control group regarding means of all laboratory data pre- -guidelines intervention. While, there were statistically significant differences between the two groups regarding means of Hg and RBCs post- and follow up guidelines intervention. Moreover, there were statistically significant differences between the two groups regarding means of WBCs post-guidelines intervention only and means of albumin follow up guidelines intervention only .

Table (5): Difference between patients in the control and the study group regarding post-readmission, cause, recurrent bleeding and medical intervention post- guidelines intervention.

	Control group		Study group		χ^2	P Value
	N	%	N	%		
-Post-readmission	20	40.0	14	28.0	0.41	0.68031
-Post-readmission causes						
-Hematemesis	13	26.0	9	18.0	0.19	0.91112
-Melena	5	10.0	5	10.0		
-Syncope	12	24.0	3	6.0		
-Abdominal pain	2	4.0	1	2.0		
-Recurrent bleeding	16	32.0	14	28.0	0.44	0.66252
-Medical intervention						
-Transfusion only	0	0.0	0	0.0	1.49	0.47400
-Transfusion & Ligation	7	14.0	5	10.0		
-Transfusion & Sclerotherapy	3	6.0	1	2.0		

Table 5 shows that there were no statistically significant differences between the study and control group regarding readmission, readmission causes, recurrent bleeding and intervention for management of re-bleeding post- guidelines intervention in spite of the number in the study group is less than in the control group.

Table (6): Difference between patients in the control and the study group regarding post-readmission, cause, recurrent bleeding and medical intervention follow up- guidelines intervention.

	Control group		Study group		χ^2	P Value
	N	%	N	%		
- Follow-up –readmission	20	40.0	5	10.0	3.46	0.00053
-Follow-up -readmission causes						
-Hematemesis	15	30.0	3	6.0	0.45	0.50404
-Melena	5	10.0	2	4.0		
Syncope	21	42.0	9	18.0		
- Follow-up recurrent. bleeding						
	20	40.0	5	10.0	3.46	0.00053
-Follow-up intervention						
-Transfusion only	0	0.0	0	0.0	3.38	0.18409
-Transfusion & Ligation	9	18.0	4	8.0		
-Transfusion & Sclerotherapy	1	2.0	1	2.0		

Table 6 shows that there were statistically significant differences between the study and control group regarding readmission and recurrent bleeding follow up- guidelines intervention. While, there were no statistically significant differences between the study and control group regarding readmission causes and intervention for management of re-bleeding follow up- guidelines intervention in spite of the number in the study group is less than in the control group.

Table (7): Difference between patients in the control and the study group regarding fatigue pre-, post- and follow up guidelines intervention.

Total Fatigue		Mild		Moderate		Severe		Mean	SD
		No	%	No	%	No	%		
Pre	Control	45	90.0	5	10.0	0	0.0	24.76	14.01
	Study	50	100.0	0	0.0	0	0.0	21.29	5.57
		$\chi^2 = 5.26$ P=0.07178						T=1.63	P=0.106
Post	Control	40	80.0	5	10.0	5	10.0	26.43	11.93
	Study	47	94.0	3	6.0	0	0.0	16.69	3.78
		$\chi^2 = 6.09$ P= 0.018						T=5.50	P= 0.000
Follow up	Control	30	60.0	15	30.0	5	10.0	28.95	11.24
	Study	33	66.0	0	0.0	0	0.0	14.98	3.28
		$\chi^2 = 3.09$ P= 0.07864						T=8.44	P= 0.000

Table 7 shows that 90% and 100 % of the control and the study group had mild fatigue pre- guidelines intervention. While, 80% and 94% of the control and the study group had mild fatigue post- guidelines intervention. Moreover, only 66% of the study group had fatigue which was mild in contrast 60% of the control group had mild fatigue follow up guidelines intervention. Also, there were no statistically significant differences between two groups regarding level of fatigue and its means pre-guidelines intervention. While, there were statistically significant differences between two groups post- and follow up guidelines intervention.

Table (8): Relation between patients' total Knowledge and recurrent bleeding in the control and the study group post- and follow up guidelines intervention.

Recurrent bleeding and readmission	Total Knowledge					
	Control group			Study group		
	N	Mean± SD	Test	N	Mean± SD	Test
Post-recurrent bleeding and readmission						
NO	34	18.86 ± 5.05	t=0.32	46	54.09 ± 5.86	t= 0.824
Yes	16	18.37 ± 5.88	P=0.750	14	51.84 ± 5.04	P= 0.413
Follow up-recurrent bleeding and readmission						
NO	30	9.08 ± 7.85	t=0.52	45	54.09 ± 6.41	t= 1.11
Yes	20	7.78 ± 9.92	P=0.607	5	51.84 ± 9.13	P= 0.272

Table 8 shows that there were no statistically significant relation between patients' total knowledge and recurrent bleeding in the study and control group post- and follow up guidelines intervention in spite of the mean score of Knowledge of patients in the control group is less than in the study group post- and follow up guidelines intervention.

Table (9): Correlation between patients' total knowledge and fatigue in the control and the study group post- and follow up guidelines intervention.

Fatigue	Total Knowledge			
	Control Group		Study Group	
	r	P Value	r	P Value
Pre & Pre	-0.06	.701	0.03	.845
Post & Post	-0.23	.105	0.16	.270
Follow up & Follow up	-0.21	.136	0.26	.072

Table 9 shows that there were no statistically significant correlation between patients' total Knowledge and fatigue in the study and control group pre-, post- and follow up guidelines intervention in the control group and the study group.

IV. Discussion

Esophageal variceal bleeding is one of the most dreaded complications of liver cirrhosis because of its high mortality and morbidity. Once the bleeding has been occurred, there can be serious complications. The nursing role increased in managing patients with an esophageal variceal bleeding as assessing their needs, maintain patients' comfort and gain much information as possible about patients' health problems and its management as a part of secondary prevention. Patient education programs are very important in esophageal varices bleeding after endoscopy procedures for increasing patients' awareness of self-care and management and prevention or minimizing complications (Mallet, Rudler & Thabut, 2017)^[41]. This study aimed to evaluate the effect of secondary prevention educational guidelines on clinical outcomes of patients with esophageal varices after endoscopic.

Regarding the studied patient's demographic characteristics, the results of the present study revealed that all of the study group and control group patients' ages were above fifty years old and more than half of the study group were females, while, more than half of the control group were male affected with esophageal varices. This is supported with the research study by El Naggar, Selim, Zaghoul and El Ahwal, 2013^[42] which entitled "Study of the causes associated with variceal rebleeding in hepatic cirrhosis" who stated that in their study ; esophageal varices occurs more often in patients between the ages of 55 and 57 years.

There were insignificance difference between the study and control group regarding age, sex and educational level. In this respect, Eid et al 2016^[43] studied Prevalence of infection in patients with portal hypertensive gastropathy owing to liver cirrhosis in Upper Egypt and stated that no significance relation between demographic characteristics between both group. In relation to residence, two third of patients in the control and more than half of patients in the study group resided in rural areas. This is supported with the study results of Abd Elkader et al 2014^[26] which aimed to assess regarding factors aggravating esophageal variceal bleeding at a university hospital in Egypt.

As regards smoking more than one third of patients in the study group and control group were smoker, this finding is supported with Luis, et al. 2011^[44] which entitled "Risk of Upper Gastrointestinal Bleeding with Low-Dose Acetylsalicylic acid Alone and in Combination with Clopidogrel and Other Medications". who added that more than forty percent of esophageal varices patients were smokers.

Concerning the study findings associated with patients' knowledge esophageal varices and its management, it was found that, about definition and causes of esophageal varices, no one of the control and the study group had satisfactory level of knowledge pre guidelines intervention with no statistically significant differences between two groups. While, more than one third of the study group and no one of control group had satisfactory level of knowledge post and after three month follow up guidelines intervention with statistically significant differences between two groups. This is in agreement with Taha et al 2015^[45] research study entitled "Impact of a Designed Nursing Intervention Protocol on quality of life for liver cirrhosis patients in Minia University Hospital", who stated that the highest knowledge score was after implementation of the nursing educational intervention in study group compared to control group and show high statistical significant differences between two groups post intervention.

One of the noticeable findings of the study was the patients' knowledge regarding the causative factors of esophageal varices, it was found that no one of the control and the study group had satisfactory level of knowledge pre guidelines intervention with no statistically significant differences between two groups. This is supported with the study findings of Liao et al 2011^[46] which entitled "Potential precipitating factors of

esophageal variceal bleeding: a case-control study" who found that patients hadn't satisfactory level of knowledge about this factor as Constipation, vomiting, severe coughing, and excessive consumption of alcohol may precipitate rupture of EV. While, more than two quarter of the study on contrast to none of the control group had satisfactory level knowledge post and after three month follow up guidelines intervention with statistically significant differences between two groups. This is in the same line with *Abd Elkader et al 2014* ^[26] research study which entitled "Assessment of Informational Needs among Patients with Esophageal Varices at One of the University Hospitals Cairo" who concluded that patients with esophageal varices had low knowledge regarding high risk related nutrition, high risk related medications and other causative factors.

As regards management method of esophageal varices, no one of the control and the study group had satisfactory level of knowledge pre guidelines intervention with no statistically significant differences between two groups. While, more than two quarter of the study on contrast to none of the control group had satisfactory level knowledge post guidelines intervention with statistically significant differences between two groups. This result is supported by the *American Society for Gastrointestinal Endoscopy 2014* ^[47] that mentioned more over half of the patient didn't know the initial management and role of endoscopy in management of esophageal varices. Additionally, the result showed that highly statistically significant difference between them after three month of educational guidelines implementation. The previous findings is supported with the study findings of *Mohammed 2016* ^[48] which entitled "Effectiveness of Structured Teaching Program on Knowledge, Anxiety State and Tolerance for Patients with Gastrointestinal Endoscopy" who revealed that statistically significant improvements in all aspects of patients' knowledge regarding endoscopy after the implementation of the educational program.

It was observed that no one of the control and the study group had satisfactory level of knowledge about proper nutrition pre guidelines intervention with no statistically significant differences between two groups. This is supported with the study results of *Abd Elkader et al 2014* ^[26] which aimed to assess regarding factors aggravating esophageal variceal bleeding at a university hospital in Egypt and who found that three quarters of the study subjects had low total knowledge score about high risk related nutrition. While, near half of the study group in contrast minority of the control group had satisfactory level of knowledge about proper nutrition post educational guidelines implementation statistically significant differences between two groups.. Additionally, the result showed that highly statistically significant difference between them after three month of educational guidelines implementation statistically significant differences between two groups. This goes in the same line with *Abd El-Fatah 2012* ^[49], in a research study aimed to assess nutritional status of patient's with liver cirrhosis at Minia University who stressed that nutritional education for all patient with liver cirrhosis is important for improving health status and the implementation of this present study program had led to significantly improvement of nutritional status, this nutritional guideline proved to have an effect on nutritional status of patients suffering from liver cirrhotic by time and after three months.

As concerning to patients' knowledge about complication that may occur from esophageal varices, only one patients of the study and control group had satisfactory level of knowledge pre guidelines intervention with no statistically significant differences between two groups. While, the most of the study group in contrast minority of the control group had satisfactory level of knowledge about complications post educational guidelines implementation with statistically significant differences between two groups. Additionally, the result showed that all the study and only ten percentage of control had satisfactory level of knowledge after three month of educational guidelines with highly statistically significant difference between two groups. From researcher view that may be due to fear of patient from more complications ,worse prognosis and losing of their life, so, they were initiative to learn the possible may happen and how they can avoid it from occurrence. It was supported by *Hiremath et al 2016* ^[50] who studied the knowledge, attitude and level of anxiety in patients undergoing upper GI endoscopy and who reported that patients increase their attention when educate the side effect and possible complications of upper endoscopy. Moreover, according to The American Society for Gastrointestinal endoscopy, the overall complication rate of endoscopy with an associated mortality of rate may reduce after patient education.

Concerning total knowledge, no one of the control and the study group had satisfactory level of total knowledge pre guidelines intervention with no statistically significant differences between two groups. While, near half of the study group in contrast minority of the control group had satisfactory level of knowledge about proper nutrition post educational guidelines implementation statistically significant differences between two groups. Additionally, the result showed that about three fourth of the study group in contrast minority of the control group had satisfactory level of total knowledge with highly statistically significant difference between them after three month of educational guidelines implementation. This result was in agreement with *Thomas and Sugirtha 2015* ^[51] research study entitled "Effectiveness of Structured Teaching Programme on Knowledge and Anxiety of Patients Undergoing Endoscopy at a Gastroenterology Centre" who mentioned that the total knowledge score of the patients increased significantly after the structured teaching program. This may explain the positive effect of implemented nursing guidelines.

As regarding to patients' vital signs, the current study showed that there were no statistically significant differences between the study and control group regarding means of all vital signs pre- and post-guidelines

intervention. While, there were statistically significant differences between the two groups regarding means of all vital signs follow up guidelines intervention except diastolic blood pressure. This is supported by **Mok 2015** ^[52] who studied attitudes towards vital signs monitoring in the detection of clinical deterioration: The majority of adverse events could be identified through consistent and accurate close monitoring of vital signs is essential to detect the deterioration with the potential to reduce adverse events. From the researcher point of view that the vital signs improved when the patient clinical condition enhanced and bleeding decreased. The previous finding is supported with the study findings of **Bayumi 2016** ^[53] which entitled "Clinical Outcomes and Patient Satisfaction Assessment among Upper Gastrointestinal Bleeding at Qena University Hospital at Upper Egypt" who reported statistically significant differences were found between the study and control group after application of management regarding patients' clinical outcomes items (bleeding attack, vital signs, laboratory tests, mental status and medical co-morbidities).

On the other hand the mean of diastolic blood pressure, there were statistically significant differences between the study and control group after three month of educational guidelines implementation. This result is similar to research study of **Shebl et al 2013** ^[30] which entitled "Effect of Nursing Intervention on Clinical Outcomes and Patient Satisfaction among Upper Gastrointestinal". There is an improvement of patients' pulse and systolic, diastolic blood pressure after nursing intervention to patients who included in the study. From the researcher view that patient decrease their stress and fear after educational guideline so pulse, respiration blood pressure enhanced.

Concerning to pain, the current study showed that there were no statistically significant differences between the study and control group regarding means of pain pre- and post-guidelines intervention. While, there was statistically significant differences between the two groups follow up guidelines intervention. It is supported with **Hamilton and Goldberg 2017** ^[54] which study entitled "Management of pain in patients with advanced chronic liver disease or cirrhosis" who mentioned that education intervention program delivered by nurses can increase patients understanding of their condition and improve pain control and reduce pain intensity. It was lined with **Narasim et al 2016** ^[55] who studied the effect of implementing pain management standards and mentioned that all changes were significant but occurred after standards implementation. Among pain measures, the majority rate of pain improvement changed and was significantly. It can accentuate the benefit from researcher nursing guidelines.

Regarding laboratory data, the present study revealed that there were no statistically significant differences between the study and control group regarding means of all laboratory data pre- -guidelines intervention. While, there were statistically significant differences between the two groups regarding means of Hg and RBCs post- and follow up guidelines intervention. It is supported with **Khalil et al 2015** ^[32] research study titled "Liver Cirrhosis: Impact of Nutritional Regimen on Patients' Outcome" who mentioned that there was improvement in study hemoglobin after implementation of the program with a statistical significant difference in study group after one and three months, while in the control group there was no statistical significant difference after one and three months. From the researcher point of view that the means of Hg and RBCs improved post- and follow up guidelines intervention. when the patients' knowledge nutritional regimen improved and adherence with nutritional regimen might be enhanced to compensate the blood lost due to the bleeding of esophageal varices. While, this is conflicted with **El Naggat et al 2013** ^[42] who report that there was no statistically significant difference between patient laboratory data (RBCs, WBCs, albumin) in the study and control group.

As concerning to patient readmission post- guidelines intervention , more than one quarter of the study group and more than one third of the control group readmitted after one month of educational guidelines implementation complaining hematemesis, melena, syncope or abdominal pain and the minority of both groups suffering from re-bleeding that needed ligation for the most of cases. Moreover, there were no statistically significant differences between the study and control group regarding readmission, readmission causes, recurrent bleeding and intervention for management of re-bleeding post- guidelines intervention in spite of the number in the study group is less than in the control group. It is consistent with a research study of **Mašalaitè et al 2012** ^[19] entitled "Recurrence of esophageal varices after endoscopic band ligation: single centre experience" who found that after endoscopic band ligation, esophageal varices recurred in 45% of cases. The early recurrence of esophageal varices occurred in 46.7% of cases. Endoscopic band ligation is associated with a high recurrence rate of esophageal varices and half of these cases were identified as early variceal recurrence.

While, regarding patients' readmission follow up guidelines intervention , more than one third of the control group and the minority of the study group readmitted after three month of educational guidelines implementation complaining hematemesis, melena, syncope due to re-bleeding that needed ligation for the most of cases. Moreover, there were statistically significant differences between the study and control group regarding readmission and recurrent bleeding follow up- guidelines intervention. While, there were no statistically significant differences between the study and control group regarding readmission causes and intervention for management of re-bleeding follow up- guidelines intervention in spite of the number in the study group is less than in the control group. It is consistent with **Salimi et al 2017** ^[56] study about outcome of upper gastrointestinal

hemorrhage who found that more than half of varices patient readmitted to hospital due to hematemesis. In this respect, **Jiang 2013** ^[57] in a study entitled "Enhanced nutritional therapy may promote wound healing after endoscopic therapy in patients with liver cirrhosis and esophageal varices" found that the enhanced nutrition group required less sessions of endoscopic treatment to achieve eradication of esophageal varices than the control group.

The current study results revealed that, there were no statistically significant relation between patients' total knowledge and recurrent bleeding in the study and control group post- and follow up guidelines intervention in spite of the mean score of Knowledge of patients in the control group is less than in the study group post- and follow up guidelines intervention. **Mašalaité et al 2012** ^[19] emphasized on the recurrence of varices occurs after endoscopic ligation and it remains unclear why some patients develop it and others do not. The time frame of the recurrence of esophageal varices varies markedly among patients. Some factors which affect the recurrence and their variation may be related to differences in the collateral veins surrounding the esophagus, venous structures connected with esophageal varices and associated hemodynamics, gastroesophageal reflux and variceal rupture, severity of liver dysfunction according to Child's classification, coagulation parameters, and endoscopic parameters: size, color, location of varices, and the presence of "red signs".

The present study findings also showed that, the medical intervention for both the study and control group who re-bleed treated by ligation at first then sclerotherapy at second line with blood transfusion from the first post and follow up educational guidelines implementation with no statistically significant differences between the two groups. It is consistent with **Salimi et al 2017** ^[56] who mentioned that majority of the subject who re-bleed treated by ligation at first then sclerotherapy. Also, **Kim 2014** ^[58] in his research study titled "Management of Acute Variceal Bleeding" and **Abd Elkader et al 2014** ^[26] research study which aimed to assess regarding factors aggravating esophageal variceal bleeding at a university hospital in Egypt who stated that, for esophageal variceal bleeding, endoscopic variceal ligation is usually performed as a first step of treatment in patients with bleeding is the achievement of hemodynamic stability through the administration of blood and intravenous fluids. Moreover, This finding is matched with **Dirkson 2011** ^[59] who stated that the management of variceal bleeding requires administration of blood products for hemodynamic resuscitation. This is incongruent with **Gustavo, et al 2011** ^[60] who compared sclerotherapy and band ligation for hemostasis of acute variceal bleeding and concluded that endoscopic sclerotherapy and band ligation were equally efficient for the control of acute variceal bleeding and added endoscopic ligation achieved variceal obliteration faster and in fewer treatment sessions and had a significantly lower rate of re-bleeding.

The current study reported that, there were no statistically significant differences between two groups regarding level of fatigue and its means pre-guidelines intervention. These results are similar to **Taha , Mahmoud & Mohamed 2017** ^[61] who studied factors affecting esophageal varices patients compliance to therapeutic regimen and developed a suggested guidelines who emphasized that the majority of subjects had fatigue and general weakness. Moreover, **Shah et al 2015** ^[62] stated that in his study entitled "Management options in decompensated cirrhosis" that all of liver cirrhosis patients with portal hypertension suffering from fatigue that affect on their daily activity living

The current study reported that fatigue was improved in both of the two groups as well as there were statistically significant differences between two groups post- and follow up guidelines intervention regarding level of fatigue and its means. This is supported with the research study of **Mahmoud et al 2013** ^[63] which entitled "The Impact of Self-Care Instructional program on Quality of Life of Patients with Liver cirrhosis at El-Kasr EL Ainy" who mentioned that mentioned that the minority of the study sample felt tired after three month. This might be due to teaching the patients the guidelines how to minimize the sense of fatigue as adequate sleep, proper nutrient and simple exercise regimen decrease their fatigue and affect positively on patient's health..

Moreover, the current study results revealed that, there were no statistically significant correlation between patients' total knowledge and fatigue in the study and control group pre-, post- and follow up guidelines intervention in the control group and the study group. **Seaman et al 2009** ^[64] sated that the confounding factors that play a role in the fatigue experience, such as co-morbidity and psychosocial status.

V. Conclusion

The study findings supported all research hypothesis as it had been proven that secondary prevention educational guidelines have a positive effect on the expected clinical outcomes of the study group which is reflected on improvement of patients' satisfactory level of knowledge and their clinical outcomes post endoscopic ligation of esophageal varices. Moreover, there were statistically significant differences between two groups post- and follow up guidelines intervention regarding knowledge, means of Hg and RBCs and fatigue. While, there were statistically significant differences between two groups follow up guidelines intervention regarding means of all vital signs except diastolic blood pressure, readmission and recurrent bleeding

VI. Recommendation

Based upon the findings of this study, the following recommendations were made:

- Replication of the current study on a larger probability sample is recommended to achieve generalization of the results and wider utilization of the designed secondary prevention educational guidelines.
- Retrospective research studies are recommended to evaluate factors associated with variceal recurrence after endoscopic ligation
- Further longitudinal researches are recommended to evaluate the effect of secondary prevention educational guidelines on improvement of patients' outcomes and prognosis after endoscopic ligation.
- Secondary prevention educational guidelines for patients with esophageal varices should be applied in all endoscopic units and should be updated periodically in order to enhance outcomes for those patients.
- Multidisciplinary team should be collaborating in management of patients with esophageal varices and helping them to overcome their problem/needs during their treatment process.
- Health education through mass media concerning esophageal varices and its prevention..

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