EFFECT OF EDUCATIONAL GUIDELINE ON NURSES' KNOWLEDGE REGARDING PATIENTS WITH MINIMAL HEPATIC ENCEPHALOPATHY

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Abstract

Background: Minimal hepatic encephalopathy (MHE) is the mildest type of spectrum of hepatic encephalopathy(HE). Patients with MHE have no recognizable clinical side effects of HE, but have mild cognitive and psychomotor deficits .The prevalence of MHE is high in patients with cirrhosis of liver and varies between 30% and 84%. **Aim** of this study was to study the effect of educational guideline on nurses' knowledge regarding patients with minimal hepatic encephalopathy. **materials and method**: A Quasi experimental study was used in carrying out this study a convenience sample of all available nurses at the hepatology word at specialized medical hospital. one tool was used to collect data consisted of 2 parts demographic data and nurses' knowledge questionnaire sheet and three tests were used in this study (pre test, post test, after 3 months test). **Result**s: the study results showed that there were no statistical significance between demographic data of nurses and total knowledge of nurses about hepatic encephalopathy in post test and3 months after educational guideline test. **Conclusion**: there was a beneficial effects of educational guideline on nurses' knowledge and there was an improvement in nurses knowledge about minimal hepatic encephalopathy after educational guideline. **Recommendation**: Continuous educational guideline based on the assessment of nurses' knowledge can be carried out periodically with emphasizing follow up.

keywords: minimal hepatic encephalopathy, knowledge, guideline.

Introduction:

Hepatic encephalopathy (HE) is a frequent complication and one of the most debilitating manifestations of liver disease, which seriously affect the lives of patients and their caregivers. Moreover, cognitive impairment associated with cirrhosis results in more use of more health prevalence of HE is related to the severity of the underlying liver insufficiency and portal systemic shunt(PSS),Minimal HE (MHE) occurs in 30%–84% of patients with cirrhosis. Cirrhosis is the 14th most common cause of death in adults worldwide but the care resources in adults than other manifestations of liver disease(1)

Hepatic encephalopathy is caused by the inability of the damaged liver to adequately remove toxins from the body. As a result, such toxins accumulate in the bloodstream and enter the brain, causing cerebral changes and episodes of neurological dysfunction. MHE is characterized by mild cognitive abnormalities that are not clinically evident, but recognizable with psychometric or neurophysiologic tests(2)

The true incidence and prevalence of HE are not fully understood because etiology and symptoms differ among patients. The incidence and the fourth cause of death in central Europe is of

hepatic cirrhosis; it results in 1·03 million deaths per year worldwide,170 000 per year in Europe, and 33 539 per year in the USA and it is recognized that the majority of patients with cirrhosis will develop HE at some point during the course of the disease(3)

Minimal hepatic encephalopathy (MHE) is the earliest form of hepatic encephalopathy & is disorder in which patients suffering from cirrhosis have normal mental and neurological status on clinical examination but exhibit reversible and quantifiable neuropsychological and neuropsychiatric abnormalities(4).

The term MHE refers to the subtle changes in cognitive function, electro physiological parameters, cerebral-neuro-chemical/neuro transmitter homeostasis, cerebral blood flow, metabolism, and fluid homeostasis that can be observed in patients with cirrhosis who have no clinical evidence of hepatic encephalopathy(5)

Nursing care of hepatic encephalopathy is to improve rest, solace, and a calm environment ,and train the patient to keep away from upsetting activity. Oversee pharmaceuticals, as requested. Request that the dietary division give determined low-protein diet, with starches supplying the majority of the calories ,give great mouth care, as requested(6). Use appropriate safety measures to protect the patient from injury and frequently assess and record the patient's level of consciousness. Monitor the patient's intake, output, and fluid and electrolyte balance, Watch for and immediately report laboratory indicators of clinical signs of anemia, Assess the patient for the desired effects of medication and watch for adverse reactions, teach the patient and his family about the disease and treatment(7)

Significance of the study

Studies have indicated that minimal hepatic encephalopathy affects 30 to 84% of patients with cirrhosis. Chronic

liver disease and cirrhosis affect more than million people in the United States and hundreds of millions all over the world. One of the recurrent and difficult to treat complications is hepatic encephalopathy(8)

The role of the nurse in managing patient with minimal encephalopathy requires specific attention. The nurse should actively involve patients and care givers in education regarding diagnosis, drug therapy, causal factors. In competent nursing care for patients with encephalopathy lead to several complications so it is important to apply specific educational nursing guideline that can entails knowledge and skills required by nurses in order to carry out care effectively, decrease patient problems, improve cost effectiveness as well as enhance patients outcomes(9).

The aim of this study:

Effect of educational guideline on nurses' knowledge regarding patients with minimal hepatic encephalopathy

Research Hypothesis:-

Nurses' knowledge regarding care of patients with minimal hepatic encephalopathy will be improved post the implementation of the educational guideline.

Materials And Method

Materials and method of the current study were discussed under the following four main designs:

1. Technical Design
2. Administrative Design
3. Operational Design
4. Statistical Design

1.Technical Design

Technical design of the current study included: used research design, study setting, subjects, and tools for data collection

Research design:

A Quasi experimental design was utilized to carry out this study. Quasi experiment used usually to evaluate the

effect of educational guideline on nurses'

knowledge regarding patients with minimal hepatic encephalopathy (pretest-immediate post test-post test II after 3 months test)

Setting:

This study was conducted at hepatology department at Mansoura Specialized Medical Hospital

Subjects:

A convenience sample of all available nurses with various ages, years of experience ,and levels of education working at hepatology department agreed to participate in the study.

Tools of Data Collection:-

The following tool was used to collect data of the study in which it is divided into two parts

Part1:-*Demographic data sheet*:-

This part was developed by the researcher to cover areas related to demographic characteristics of nurses including (name, age, level of education, and years of experience).

Part2:-*Nurses' Knowledge Questionnaire sheet:*

Which consists of three items:-

1- Nurses' knowledge about hepatic encephalopathy questionnaire sheet:

It was developed by the researcher, constructed and reviewed utilizing the most recent and relevant literature, which include series of questions to elicit nurses' knowledge about hepatic encephalopathy. It was composed of13multiplechoice questions

Scoring system of Knowledge Questionnaire was done as follows, each correct answer scored one point, while each incorrect answer scored zero point, and missed answer or not answered scored zero point.

2- Nurses' knowledge about psychometric tests:

It includes series of questions about nurses 'knowledge related to psychometric tests. It is composed of 11 questions used to detect minimal hepatic encephalopathy as (psychometric tests which help to detect hepatic encephalopathy, Number connection test A, how to make it, if nurses done it before ,the patient is considered hepatic encephalopathy when the result of test is, definition of digit symbol test, test result, if it is important to explain it to patient before doing it, do you grasp patient attention when he forget a number in connection)

3- Nurses' knowledge regarding nutrition of patient with minimal hepatic encephalopathy :

It consisted of 30 items to elicit nurses' knowledge about nutrition suitable for patient with minimal hepatic encephalopathy

Scoringsystemofeachitemwasmade using3-piont likert scale ranging from 0to2 where' 0' indicate that the knowledge was wrong,' 1'don't know and'2 'completely right

2. Administrative design:-

Official written permission to conduct the study was obtained by the researcher from responsible authorities of hepatology department of specialized Medical hospital ,Mansoura University. Verbal explanation of the nature and aim of the study was performed to nursing staff

3. Operational Design

This design involves the preparatory stage, pilot study, and field work which include sampling and data collection (assessment phase, planning phase, implementation phase, and evaluation).

I- Preparatory stage:

After extensive review of literature, the researcher was acquainted with the actual dimension and magnitude of the problem. Moreover, it was a guide for developing tools of data collection, and teaching material (booklet) used in the study

a) The tool revised by5 experts in the field of the study to ensure

content validity of tool and the necessary modification was done.

b) The tool was tested for reliability using pretest-posttest method; the tool was applied on 10 nurses at hepatology department in Specialized-Medical Hospital, MansouraUniversity.Thetoolwasr epeatedagainforthesenursesaftert woweeks. The reliability was assured by means of the cronbach's alpha test=.971.

c) The guideline was developed by the researcher based on review of literature. A booklet containing the content of the guideline was designed by the researcher and tested for content validity and the necessary modification was done .It is written in a simple Arabic language and supplemented by photos and illustrations to help nurses understanding of the content.

II- Pilot study:-

It was carried out on 5nurses in the hepatology department at Mansoura specialized medical hospital to test applicability, visibility and clarity of questionnaire items, to estimate time needed for filling the sheet as well as to identify any possible obstacles that may hinder data collection ,those nurses were excluded from the main study sample.

III- Filed work:
A-Sampling:-

Once the necessary approvals granted to proceed with the proposed study, subject who met sampling criteria &agreed to participate in the study, interviewed by the researcher to collect the necessary data and implement educational guideline after explanation of the purpose of the study

A. Data collection:
I. *Assessment phase*

The researcher started by introducing herself to the nurse s and

giving them a brief idea about the aim of the study.

Verbal consent approval was obtained from each participating nurse prior to her inclusion in to the study. Clarification of the nature and purpose of the study was on the interview with each nurse.

The researcher emphasized participation is absolutely voluntary and confidential .Anonymity, privacy, safety and confidentiality was absolutely assured throughout the whole study and the right to withdraw from the study at anytime.

Each nurse was interviewed individually before applying the planned educational guideline in order to collect the baseline nurses data using the study tool.

Interviewing each nurse individually. The average time taken by the investigator to fill out the form for each nurse was 20 to 30 minutes.

II. *Planning phase*
Content of the guideline:

The content of the guideline included theoretical and practical component.

Educational components:

1. Over view about liver and its function
2. Stages of hepatic encephalopathy
3. Signs and symptoms of minimal hepatic encephalopathy
4. Treatment of minimal hepatic encephalopathy (medication and nutrition)
5. How to avoid occurrence of hepatic encephalopathy
6. Psychometric tests (types, how to do it, time needed for each test, essential instructions when doing it).

III. *Implementation phase*

a) The educational guideline was implemented for the study group individually or in a group. It was

conducted in sessions; each session took about 20 to 30 minutes.

b) During each knowledge session the researcher used simple, brief and clear words. At the end of each session, a brief summary was given by the researcher.

c) Moreover, The booklet was given to each nurse in the study group to attract their attention, motivate them and to be as a reference.

d) Data collection covered a period of 6 months, started from the first of March 2015 to the end of August 2015,3 days a week at the morning shift.

VI. *Evaluation phase:*

Each nurse in the study group was interviewed after applying educational guideline sessions to assess her knowledge using the study tool. The post test one is done immediately after guideline and post test two is done after 3 months of applying educational guideline.

Statistical analysis:

Data were collected, tabulated and statistically analyzed using Statistical Package for Social Sciences (SPSS)

version 21. The normality of data was first tested with one-sample Kolmogorov-Smirnov test.

Qualitative data were described using number and percent. Association between categorical variables was tested using Chi-square test. Continuous variables were presented as mean± SD (standard deviation). The two groups were compared with Student *t* test while paired groups compared by paired t-test. Analysis Of Variance (ANOVA of F test) used For comparison of means of more than two groups .For all above mentioned statistical tests done, the threshold of significance is fixed at 5%level (p-value).The result was considered: Non-significant when the probability of error is more than 5%

(P>0.05).Significantwhentheprobability of error is less than 5% ($p \leq 0.05$).

Highly significant when the probability of error is less than 0.1% ($p \leq 0.001$).

The smaller the p-value obtained ,the more significant are the results.

Results

Part I: Demographic characteristics for the studied nurses.

Table(1): Frequency distribution of demographic characteristics of the studied nurses (N=50)

Items	Frequency No=50	Percent %
		Age
18-<30 years	26	52
30-<40 years	24	48
Educational level		
Nursing diploma	18	36
Nursing institute	20	40
Bachelor degree	12	24
years of experience		
Less than5years	21	42
From 5-10years	16	32
Morethan10years	13	26

This table illustrates that more than half of the nurses (52%) aged from18to30 years and 48% of them aged from 30 to 40 years old. In relation to educational level

less than half of the nurses (40%) graduated from nursing technical institute, about one third of the nurses 36% had nursing diploma, and less than quarter of them (24%) had bachelor degree**.** Regarding years of experience of the studied nurses, the table shows that 42% of nurses were less than 5years of experience, 32% were from 5to 10 years and 26% of them were more than 10 years of experience in the hepatology department

Part II:-Nurses' knowledge about hepatic encephalopathy pre, post and 3 months after educational guideline (N=50)

Table(2): Comparison between subtotal and total mean score of the studied nurses' knowledge about liver and hepatic encephalopathy pre, post and 3 months after educational guideline(n=50)

Items	Pre (n=50)	Post (n=50)	After3ms (n=50)	Paired t–test	p-value
Related to liver	8.52±4.78	15.98±2.26	15.16±2.79	t1=10.1 t2=8.47 t3=1.78	P1=≤0.001 **p2=≤0.001 **p3=0.078
Related to hepatic encephalopathy	4.64±2.07	7.88±.824	7.62±1.36	t1=10.25 t2=8.47 t3=1.15	P1=≤0.001 **p2=≤0.001 **p3=0.253
Related to minimal hepatic encephalopathy	12.56±5.11	26.42±2.41	23.22±4.25	t1=17.78 t2=13.19 t3=2.25	P1=≤0.001 **p2=≤0.001 **p3=0.026*
Total score	25.68±10.21	50.21±3.95	46±7.15	t1=19.73 t2=15.86 t3=2.35	P1=≤0.001 **p2=≤0.001 **p3=0.021*

(*) statistical significant, p≤ 0.05 &(**) highly statistical significance, p≤ 0.001
p1pre vs. post test&T1 pre vs. post test&p2 pretest vs. after 3 months test&T2 pre vs. after 3 months test & P3 post vs. after 3 months&T3 posttest vs. after 3 months test

Table(2):shows that there were highly statistical significance differences between level of knowledge of the studied nurses pre versus post and pre versus 3months after implementing educational guideline p =≤0.001. Nurses knowledge in post test have the highest score of Mean± S.D versus pre test and 3months after educational guideline.

Table(3): Comparison between total mean score of the studied nurses' knowledge about psychometric tests to detect minimal hepatic encephalopathy(n=50).

	Pre(n=50)	Post (n=50)	After 3ms (n=50)	Paired t–test	p-value
Mean± SD	0.46±0.64	11.36±2.07	10.32±3.71	t1=35.49	P1=≤0.001**
Min-Max	0-3	5-14	0-14	t2=18.54	P2=≤0.001**
				t3=1.72	P3=0.087

This table portrays that there were highly statistical significance between pre versus post and pre versus after 3 months of implementing educational guideline p=≤0.001. Also this table shows that nurses 'knowledge about psychometric tests post test have the highest score of Mean± S.D versus pre test and 3months post educational guideline

Table(4):comparison of total mean score of knowledge of the studied nurses regarding nutrition of patient with minimal hepatic encephalopathy (n=50)

	Pre(n=50)	Post(n=50)	After3m (n=50)	Paired t–test	p-value
Mean± SD	43.66±5.64	53.98±4.91	51.74±5.03	t1=12.482	P1= ≤0.001**
Min-Max	27-56	28-60	34-60	t2=7.3	P2= ≤0.001**
				t3=1.83	P3= 0.069

This table illustrates that nurses' knowledge about nutrition of patient with minimal hepatic encephalopathy in immediate post test have the highest score of Mean ±S.D (53.98±4.91) versus pre test and versus after 3months test. Also this table shows that there were highly statistical significance differences between pre versus immediate post and between pre versus after 3months of educational

Table(5): Comparison between total mean score of total knowledge of the studied nurses about minimal hepatic encephalopathy pre, post, and 3months after educational guideline(n=50)

	Pre(n=50)	Post(n=50)	After3m (n=50)	Paired t–test	p-value
Mean± SD	74.10±18.66	108.24±8.01	104.44±9.74	t1=11.64	P1=≤0.001**
				t2=9.14	P2=≤0.001**
Min-Max	43-97	88-132	75-115	t3=1.81	P3=0.074

guidelines p=≤ 0.001.

This table illustrates that there were highly statistical significance difference between pre versus post and between pre versus three months after implementing educational guideline p=≤0.001, also this table shows that nurses' knowledge in immediate post test have the highest score of Mean ±S. D versus pre test nor 3months after educational guideline test**.**

Table(6): Relation between demographic characteristics and total knowledge score of the studied nurses about minimal hepatic encephalopathy pre, post and 3months after educational guideline (n=50)

Items	Pre	p-value	Post	p-value	After3ms	p-value
Age						
18-< 30year	72.48±10.62	t=1.453 p=0.153	116.54±9.06	t=0.841 p=0.405	98.50±10.65	t=0.570 p=0.571
30-<40 year	67.13±14.71		114.62±6.74		96.91±8.79	
Educational level						
Nursing diploma	67.44±11.87	F=3.25 p=0.047*	114.05±8.12	F=2.60 p=0.085	97.05±9.78	F=.301 p=0.741
Nursing institute	67.25±13.2		114.66±8.54		97.20±9.01	
Bachelor degree	77.58±10.41		120.60±4.57		99.66±11.38	
years of experience						
Less than 5years	70.23±12.70	F=.025 p=0.975	116.08±8.82	F=1.259 p=0.293	98.28±10.58	F=0.069 p=0.933
From5-10years	69.68±13.95		117.50±6.26		97.06±9.24	
More than10years	69.23±11.93		112.76±7.99		97.69±9.62	

This table reports that there were no statistical significance association between nurses' total knowledge about hepatic encephalopathy and age, years of experience of the studied nurses pre, post and 3months after educational guideline (p>0.05). There was statistical significance association between educational level of the studied nurses and the total knowledge pre educational guideline (p=0.047), and no statistical significance between educational level of the studied nurses and their total knowledge post and after 3months of educational guideline (p>0.05) also nurses with bachelor degree have the highest score of Mean± S.D pre, post and 3months after educational guideline.

Discussion:

Minimal hepatic encephalopathy (MHE) represents a part of the Spectrum of hepatic encephalopathy (HE) in its mildest form. The prevalence of MHE in liver disease has been reported to vary from 30% to 84%, depending on both the tests used and population studied . Patients with MHE have no recognizable clinical symptoms of HE but have only mild cognitive and psychomotor deficits. Furthermore, MHE can have a far-reaching impact on quality of life, ability to function in daily life and progression to overt HE. MHE has an impact on the ability to drive a car and may be a significant factor behind motor car accidents (10)

In the present study ,regarding to the studied nurses demographic characteristics, more than half of the studied nurses, their age was between 18 to 30 years old, this is on contrary with *Ragab,etal.,(2013)(11)* who mentioned that about half of the nurses their age>30years.

Concerning educational level less than half of the studied nurses were graduated from nursing institute, and as regarded to years of experience are less

than5 years of experience, on contrary *Saker.,(2009)*(12)mentioned that the majority of nurses were nursing diploma ,more than half of them have experience more than 6 years. Also *Mohamed &Wafa.,*2011(13)revealed that nurses who had diploma of nursing are more than two third and less than half of the study group had experience ranged between 6-10 years. Also *Vlaisavljevic &Rankovic .,(2015)* (14) mentioned that the majority of nurses in their study had only secondary medical school. And according to working experience less than half of the respondents had less than 20 years of experience ,while more than half of the nurses had over 20 years of working experience.

In relation to nurses' knowledge about liver and hepatic encephalopathy the current study presented that most of the studied nurses had poor level of knowledge before implementing educational guideline this may be due to insufficient courses related to disease included in their undergraduate curriculum of nursing education with lack of continuous education and training programs.

In this study the majority of nurses have good knowledge about liver and hepatic encephalopathy after educational guideline in the same line with *Abdullaa& Abdullaa.,(2013) (15)*who showed that educational intervention had appositive impact on knowledge and practice of nurses. Also *Prochaska&Velicer.,(2012)* (16)who noted that nurse's knowledge improved immediately after receiving the educational program.

When comparing between knowledge pre and post educational guideline, knowledge increased in apparent level from very low to high level of knowledge and there were highly statistical significance differences between pre versus post and pre versus after

3months of implementing educational guideline p=≤0.001.and that resulted from nurses' needs to know a lot about psychometric tests to detect minimal hepatic encephalopathy ,this finding is supported with ***Mohamed &Wafa.,2011***(17) who noted that a great improvement in nurses knowledge after educational program with highly statistical significance difference between pre and post educational program.

Regarding to nurses' knowledge about psychometric tests most of the studied nurses knew psychometric tests as number connection test A and digit symbol test that are used to detect minimal hepatic encephalopathy after educational guideline in the same line ***Bass.,etal (2010)*** (18) who reported that in the absence of obvious physical examination findings of hepatic encephalopathy (HE), neuropsychometric tests can be used to identify minimal HE.

In this study, NCT-A and DST were selected because of their sensitivity, simplicity and suitability for epidemiological studies this is supported by ***Gad.,(2011)*** (19) who stated that MHE is defined as the presence of at least one abnormal psychometric test and/or abnormal slowing of the EEG.

On contrast ***Blibel &Al-Qsami., (2012)***(20) reported that these tests are time consuming and their reliability is decreased by the learning effect with repetitive administration ,they are commonly used for research purposes*,* also ***Blei & Cordoba .,(2001)*** (21) stated that a general problem with psychometric tests is that they are not specific to HE and other forms of encephalopathy such as in the case of chronic alcoholism, Wilson disease ,and possibly chronic hepatitis C infection can show similar results and findings

In the current study there is a great improvement in nurses knowledge about nutrition of patient with minimal hepatic encephalopathy after educational guideline

and this proved the importance of educational guideline in raising awareness of nurses about disease and this is supported with ***Vlaisavljevic &Rankovic .,(2015)*** (22) who stated that the continuous education and improvement of nurses is of significance when it comes to new medical apprehension .Educational f actor would ensure that quality of provided care is both effective and efficient.

Considering knowledge of nurses regarding nutrition of patients the majority of the studied nurses knew after educational guideline that patients with minimal hepatic encephalopathy should take small diets during day ,giving small snake at night &patients should take vitamins and minerals as Zinc. This is in the same line with ***Amodio .,etal (2013)***(23) who suggested that patients with liver cirrhosis should receive 35–40 kcal/kg per day, multiple(5-6) small feedings, with a carbohydrate-rich evening snack have been recommended.

In the current study, majority of nurses knew that patient should reduce taking protein not restricting taking it and patient should be given at least1.2-1.3 gm of proteins daily and vegetarian proteins are better than animal proteins post educational guidelines, this is in agreement with ***Guevara.,etal(2011) (24)*** who stated that malnutrition with resultant muscle wasting has been shown to worsen HE ,vegetable protein based diet may be recommended. Also ***Bemeur.,etal (2010)*** (25) stated that protein restriction should be avoided in all but a small number of patients with severe protein intolerance and that protein be maintained between 1.2 and 1.5 g of proteins per kg of body weight per day and daily intake of 30–40 g vegetable protein has been found to be effective in the majority of patients. On contrary ***Donaghy.,(2002)***(26) Mentioned that restriction of dietary protein was long considered a mainstay in the management

of liver disease and hepatic encephalopathy.

In this study majority of nurses knew that salt restriction in cans and preserved foods & giving salted fish to patient, soft drinks should be avoided and more than half of them knew that salt restriction is important. On the same line *Biddulph.,(2015)* (27)who showed that patients with hepatic encephalopathy should limit salt consumption, Packaged and processed foods such as canned soups and vegetables.

In contrast with *Amodio .,etal (2013)* (28) who reported that Hyponatremia may worsen HE; it should be prevented as far as possible and should always be corrected slowly, also*, Eghtessad .,etal(2013)*(29) have observed no advantages to a sodium restricted diet and that a normal sodium diet was advantageous for patients since it increased dietary palatability.

Most of nurses reported that vitamins as K and Care important to patients with encephalopathy after guideline ,this is in agreement with *Gundling.,etal(2007)*(30*)* who mentioned that supplementation of vitamin K in conditions with high risk of bleeding such as the presence of impaired prothrombin time in patients with encephalopathy and administration of multivitamin preparations is recommend.

Regarding mean scores of nurse's knowledge pre, post and after 3 months test of implementation of educational guideline. The study revealed that there is a better improvement in nurse's knowledge on post and after 3months test. This improvement might be related to the fact that about half of nurses were <30years ,this age might have good readiness for learning new things and From researcher' s point of view attending continuing nursing education courses will keep nurses knowledge up to date**.**

These results are in agreement with those of *Prochaska& Velicer.,(2012)***(31)** who noted that nurse's knowledge and practice improved immediately after receiving the training program, also *Endevelt.,(2009)*(32) which indicated that the younger nurses are more knowledgeable than old ones. This may be due to the program that make refreshment in their knowledge and skills which gained over the time.

In the present study, the results revealed that about three quarters of the studied nurses had poor level of knowledge before implementing of the educational guideline and this was noticed in all the tested areas of knowledge. This reflects the lack of scientific preparation of nurses &insufficient courses in their under graduate curriculum of nursing education with lack of continuous education, these results are in agreement with*, Ragab, etal.,(2013)*(33) who stated that about half of the nurses had poor level of knowledge before implementing of the training program .Also *Fayed.,etal(2016)*(34) stated that the majority of nurses had poor knowledge pre educational program implementation (100%) ,while71 .7% had good knowledge after program implementation and more than two third had average knowledge eat follow up test (68.3%).

The significant improvements demonstrated at the post-guidelines phase indicate that these nurses were in real need for such information and guideline and this is supported with *Ali &Taha ., (2014)* (35) who mentioned that they found very low levels of knowledge among the nurses in their study before implementation of the program.

After three months post-test, the present study revealed that the percentages were decreased, this indicated that the improvement in knowledge was decreased three months after implementing of educational guideline. This result might be

explained by the fact that, knowledge retention is usually affected by the time .In this study the researcher measure nurses knowledge on different intervals to measure their knowledge retention.

In this regards *Mohamed.,(2009)(36)* found a direct relation between memory loss and length of time that lapses after a certain educational event. Also he reported that nurses who had poor levels of knowledge and/ or skills before the exposure to a training program underwent a significant improvement after the implementing of the program but this improvement usually decreased by time *.Dudek.,(2011)*(37)studied the intention of testing the retention of certain nursing skills and knowledge of registered nurses. There has been an initial improvement after performing the training program, but there has been a significant decrease in retention of knowledge 3 months later, The findings of his study reflect similar results to previous research works, suggesting that retention of skills and knowledge quickly deteriorates with time if not used or updated regularly.

In this study there were no statistical significance difference between nurses demographic data and their total knowledge about minimal hepatic encephalopathy "general knowledge ,psychometric tests and nutrition of patient with minimal hepatic encephalopathy "post and 3months after educational guideline (p>0.05) in consistence with *Mohammed, and Weheida, .,(2014)* (38) who found that, no statistical significant relationship between nurses' level of knowledge & their qualification .Also *Mostafa.,(2008)(*39) reported that no statistical significant relationship was found between nurses knowledge &their age and *Ali &Taha ., (2014)* (40) found that there were not significance correlation between level of experience and knowledge of nurses in their study (p-value=>0.05).

In contrast *Taha.,(2014)*(41)who mentioned that a statistically significant relationship was found between nurses knowledge &their age, also *Ali &Taha ., (2014)*(42) demonstrates that ,statistically significance correlation between nurses age and knowledge

In my study statistical significance between educational level of the studied nurses and total knowledge score pre educational guideline, this is supported with *Hussein.,(2012)*(43)studies who reported significant relationship between nurses knowledge and their educational level in contrast *Taha.,(2006)*(44)found no statistical significant relationship between nurses' level of knowledge and their qualification

These guidelines are urgently designed to assess nursing staff in developing and enhancing the knowledge & skills needed to provide high standards of care to their patient. *Gunson.,(2011)(45)*agreed that those guidelines are urgently needed to provide up- to-date knowledge and improve nurse's competency and skills. *Morse.,(2010)*(46) added that continuing education courses will be useful for the nurses because it helps nurses to be kept up to date with new knowledge, skills and information. As well, *Tokars & Ali.,(2010)* (*47)*stated that education and training are two components of staff development and improve care provided to patients.

Conclusion:

Based on the present study findings, it was evident from these findings that there was a beneficial effects of educational guideline on nurses' knowledge and there was an improvement in nurses knowledge about minimal hepatic encephalopathy after educational guideline.

Recommendations

1. Continuous educational guidelines based on the assessment of nurses' knowledge can be carried out periodically with emphasizing follow up.
2. Encourage continuous supervision, guidance and evaluation of nurses' knowledge who are caring for patients with minimal hepatic encephalopathy.
3. Encourage the importance of availability of updated guideline books for the nurses to guide their practice toward patients with minimal hepatic encephalopathy.
4. Emphasize the importance of patients' medical staff and public awareness about minimal hepatic encephalopathy "early detection, its prevention and care of it throughout the mass media, internet".
5. Nurses should be trained on psychometric tests, how to make it and how to detect signs of minimal hepatic encephalopathy
6. The most important concern must be given for nursing curriculum to be more detailed not summarized in order to enable them to apply what had been studied.
7. Replication of the current study on larger probability sample is recommended to achieve generalized ability

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