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REVIEW ARTICLE

THE EFFICACY OF TWO TEACHING METHODS ON NURSE'S KNOWLEDGE REGARDING HEPATIC ENCEPHALOPATHY

¹Hend M. Al-Azazy and ²Safaa E. Sayed Ahmed

¹Assistant Professor of Medical-Surgical Nursing

²Lecturer of Critical-Care Nursing, Faculty of Nursing, Tanta University

^{1,2}Faculty of Nursing, Tanta University, Tanta, Egypt

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ABSTRACT

Continuing education for professional nurses is essential for effective nursing care. The rapid changes taking place within healthcare systems have increased the pressure on nurses to engage in continuing education programs. Continuing education improves knowledge base, skill level, change behaviors, attitudes and improve clinical outcomes which have an important role in staff development. The present study aimed to evaluate the efficacy of two teaching methods on nurse's knowledge regarding hepatic encephalopathy. The study was conducted at medical Intensive Care Unit at Tanta University Hospital. It included 60 critical care nurses working in the previously mentioned setting and they were divided into two groups randomly and alternatively, 30 nurses in each group. Two tools were used in the study for data collection, tool I: nurses' knowledge structured questionnaire sheet. It was divided into two parts: part A: nurse's socio demographic assessment sheet. Part B: nurse's knowledge assessment sheet, tool II: Nurse's satisfaction evaluation questionnaire sheet. The main results of this study were; more than half of nurses (53.3%) in the traditional lecture teaching group had poor knowledge level about hepatic encephalopathy in the pre-test compared with less than half (40%) of the nurses in the web-based teaching group. On the other hand about three quarter (73.3%) of nurses in traditional lecture teaching groups had good knowledge compared with less than half (40%) in the web-based teaching group after completing the courses. Also the result revealed that more half (56.7%) of nurses in traditional lecture teaching group had high level of satisfaction regarding teaching method compared to one third (33.3 %) of nurses in web based teaching group. The study recommended that in-services training program should be done continuously for updating nurse's knowledge and practices regarding hepatic encephalopathy using traditional lecture method and teaching.

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INTRODUCTION

Continuing education for professional nurses is essential for effective nursing care. The amount of knowledge required to take care of critically ill patients cannot be obtained simply through experience on the unit but through continuing education. Nurses have a professional and legal responsibility to update their knowledge and apply that knowledge to the bedside care (Witt, Catherine L 2011; Gallagher 2006). Hepatic encephalopathy (HE) is a serious and potentially fatal complication in patients with cirrhotic liver disease. HE not only results in a diminished quality of life, but confers a poorer prognosis in patients with underlying liver cirrhoses. Episodes of overt HE result in frequent hospitalizations, and pose a formidable burden on the healthcare system. Thus, nurses and other primary care physicians who care for patients with severe liver disease play a key role in identifying the condition. (Poh Z and Chang 2012; Wakim-Fleming 2011) Continuing education improves knowledge base, skill level, change behaviors,

attitudes and improve clinical outcomes which have an important role in staff development. Descriptive studies have also emphasized the importance of access to continuing education as an effective factor in reducing professional isolation, increasing the willingness to work in remote locations and improving staff performance. (Gallagher 2006) Despite the abundance of continuing education offerings, many nurses do not participate in them. A number of barriers have been cited in the literature, including financial considerations, lack of institutional support, time constraints, and family commitments (Witt Catherine L 2011; Demong 1999; Curran *et al.*, 2006). However Participation in continuing education programs has revealed to be directly related with a better nursing practice. Furthermore, properly training professionals have demonstrated high productivity, less occupational accidents or errors, a better organizational climate, work satisfaction and better patient results (Peña Flores and Alonso Castillo 2006; Chakraborty *et al.*, 2006; Skess 2010; Schweitzer and Krassa 2010).

The traditional lecture has been the primary educational format used in continuing nursing education to date (Dougal and Gonterman 1999; McAlpine 1996). In traditional lecture, the

*Corresponding author: Safaa E. Sayed Ahmed

Lecturer of Critical-Care Nursing, Faculty of Nursing, Tanta University

^{1,2}Faculty of Nursing, Tanta University, Tanta, Egypt.

learning occurs within a physical boundary. The source of content is shift from the textbook and the teacher to a student. The teacher is the sender, the educational material is the message, and the student is the receiver of the information (Gowri and Minolin 2013). As a teaching strategy, the traditional lecture is one to which provide students with the necessary information for their classes. Further, experience indicates that students have an increased comfort level with this traditional teaching methodology partly because they can remain in a passive role (Lauver *et al.*, 2009). Although the lecture format can be an effective way to deliver information to a large number of students, however several studies showed that this method has several limitations; it does not appeal to a variety of learning styles, lack learner participation strategies, require lengthy educator preparation, not recognize personal differences and learners' needs (Billings and Halstead 2005; Harrington and Walker 2003; Dunn and Griggs 1998; Johnson *et al.*, 2000). One alternative method to the traditional lecture format is the use of online technology in continuing nursing education. Technology has revolutionized educators' ability to facilitate professional nursing competence through the use of web based education (Benson 2004; Bernhardt *et al.*, 2003). Moreover, today most traditional training and education institutions intend to use online learning environments to provide some level of course delivery. This has also sparked the interests of researchers in the discipline (Tesone and Ricci 2008). A web-based method can be used as an online mode of teaching and learning and used as a substantial supplement to traditional teaching methods (Kuo *et al.*, 2007). Online instruction is distributed over the internet or an intranet and conveyed through a browser, such as Internet Explorer or Netscape Navigator. Hereafter, it is referred to as web-based instruction (Olson and Wisher 2002). Using web-based instruction helps students get excited about their learning; they become more active and involved. Also web based instruction is a rich educational resource that promotes and facilitates student learning and is increasingly being used to deliver course content in nursing (Gowri and Minolin 2013). Meanwhile, an instructor may hold face-to-face lectures in a classroom but post the class syllabus, assignments, and grades on the Web (Olson and Wisher 2002).

Teaching through the web can overcome some of the limitations of face-to face teaching methods and provides easy and adaptable access to learning (Attack 2001). Moreover, using the web to provide continuing nursing education has many benefits including; more time is saved, information and skills can be shared, adherence to adult learning principles and accommodation of multiple learning styles (Kuo *et al.*, 2007; Fordis *et al.*, 2005; Gerkin *et al.*, 2009). Although there are advantages for using the web based learning, the literature review did uncover some barriers to implementation and use of web based learning. However, lack of computer access and insufficient computer skills are the most frequently cited barriers (Attack and Rankin 2002; Attack 2003; Schmitt *et al.*, 2004; Smith 2005). Finally, nursing staff members constantly need to update their knowledge and professional abilities, continuing education has increasingly become essential for nurses working in intensive care unit to guarantee high-quality nursing practice (Bartels 2005; Eustace 2001; Urbano and Jahns 1988). Therefore the aim of this study is to evaluate the

efficacy of two teaching methods on nurse's knowledge regarding hepatic encephalopathy.

Aim of the study

The aim of the study was to evaluate the efficacy of two teaching methods on nurse's knowledge regarding hepatic encephalopathy

Research hypothesis

- Traditional lecture expected to be more effective as a teaching method than web-based.
- Web-based teaching expected to be more effective as a teaching method than traditional lecture.
- Nurses who are taught by traditional lecture expected to be more satisfied than those taught by web-based method.

MATERIALS AND METHODS

Materials

Research design

The study was quasi- experimental design.

Setting

The study was carried out at Medical Intensive Care Unit, Tanta University Hospital and Emergency Hospital.

Subjects

All critical care nurses (60 nurse) working in medical intensive care units at the time of the study, were divided into two groups randomly and alternatively, 30 nurses in each group.

1) Traditional lecture teaching group: Comprised of 30 nurses. This group was taught by traditional lecture.

2) Web based teaching group: Comprised of 30 nurses. This group was taught by internet web site.

Tools of the study

Two tools were used in the study.

Tool (1): Nurses 'Assessment Sheet (Poh and Chang 2012; Wakim-Fleming 2011). This tool was divided into two parts.

Part A: Nurse's Socio-demographic Assessment Sheet

This part used to assess nurse's sociodemographic data such as age, level of education, marital status, years of experience and any previous in-service courses or workshops related to hepatic encephalopathy.

Part B: Nurse's Knowledge Assessment sheet:

This part was developed by the researcher after reviewing of recent related literature to assess nurses' knowledge regarding

hepatic encephalopathy; it was used two times; before starting the teaching method and one week after finishing the program.

- The knowledge questionnaire consisted of 19 multiple choice questions and two short answer questions. Correct answers scored 1 and incorrect or no response answers scored 0 for multiple choice questions, short answer questions scored 3 for correct and complete answer and incorrect or no response answers scored 0.
- The total grades were summed up and converted into total score percent and calculated as follow; less than 50% was graded as poor, 50% to less than 75% score was graded as fair, and more than 75% score was graded as good.

Tool II: Nurse's satisfaction evaluation questionnaire sheet

(Gowri and Minolin 2013; Tesone and Ricci 2008; Gerkin *et al.*, 2009). This tool consisted of 10 items and was used for both groups to assess level of nurses satisfaction about the teaching method. It was used after completing the teaching methods. Level of nurses satisfaction were rated using 5 point Likert scale (1=strongly disagree, 2= disagree 3=neutral, 4= agree, 5=strongly agree). The total grades were summed up and converted into total score percent and calculated as follow; less than 50% (5-11) was graded as low level of satisfaction, 50% to less than 75% score (12-18) was graded as moderate level of satisfaction, and more than 75% score (19-25) was graded as high level of satisfaction.

METHODS

- A permission to carry out the study was obtained from responsible authorities.
- Nurses' consent to participate in the study was obtained
- Nurses' confidentiality was ascertained.
- Tools of the study were developed after review of related literature; they were tested for comprehensive, appropriateness and revised by (5) jury for content validity and modification was done.
- Tools of the study were tested for its reliability.
- A pilot study was conducted on 5 nurses to test the applicability of the tools.
- Data were collected over a period of 3 months starting from December 2013 to February 2014.
- Tool I; questionnaire sheet was developed by the researcher to assess the nurses' basic knowledge related to hepatic encephalopathy as a pre and post test after implementation of two teaching methods. The time taken for pre and post test evaluation was one hour.
- Tool II was used to assess level of satisfaction of nurses regarding teaching methods after finishing teaching program.
- Web based course consisted of a self-study search about hepatic encephalopathy through the Internet.
- Before starting the web based course, the researchers met with nurses and explained how to use web based site and clarified outline of the research related to hepatic encephalopathy.
- Web based group were allowed to access the educational material for one week.

- In order to have interaction between the researchers and learners, E-mailing and cell phone were used for answering questions.
- The traditional lecture group was subdivided into three subgroups, 10 nurses each and each group perceived the same content.
- The traditional lecture group attended an interactive one - hour lecture for 2 consecutive days given by a researchers. The nurses were able to actively participate in the emerging discussions and ask their questions about the course materials and also make their class notes during the lecture.
- Teaching material for traditional lecture group was developed by the researchers based on literature review as follow:-
- Session one consisted of the aim of the research study, introduction about critically ill patients definition of hepatic encephalopathy, causes, and predisposing factors, types, signs and symptoms, and methods of assessing patients with hepatic encephalopathy.
- Session two consisted of management strategies, nursing role and summary of lectures related to hepatic encephalopathy.
- Teaching media includes group discussion with power point.
- Post test evaluation was carried out for both groups after one week from implementation of traditional and web based teaching using tool (I) part (B) and tool II. The time taken for post test evaluation was one hour for each nurse.

Statistical analysis

The analysis was performed using statistical software SPSS version 16. For quantitative data, mean and standard deviation were calculated. For qualitative data, a comparison between one group before and after intervention was done by using Chi-square test (χ^2). For comparison between means of one group before and after intervention, paired t-test was used. A significance was adopted at $P < 0.05$ for interpretation of results of tests of significance.

RESULTS

Table (1) presented distribution of the studied nurses according to sociodemographic characteristics. It was observed that the average age of nurses was 29.67 ± 5.701 in traditional lecture teaching group and 28.07 ± 5.152 in web based teaching group. All of nurses (100%) in the traditional lecture teaching group and majority of nurses (86.7%) in web based teaching group were female. Also more than two third of nurses (70.3% and 66.7%) in traditional lecture and web based teaching group respectively were married. In relation to years of experience, it was found that more than half of nurses (53.3%) in web based teaching group had an experience less than 5 years versus one third (33.3%) in traditional lecture teaching group. This table also showed that more than half of studied nurses in traditional lecture teaching group (60%) and web based teaching group (60.7%) had a baccalaureate degree while minority of studied nurses in traditional lecture and web based teaching group (20% and 6.7%) respectively had diploma degree. Regarding Previous in serving courses or workshop about hepatic

encephalopathy, it was observed that all nurses (100.0%) in traditional lecture and web based teaching group didn't receive any previous in serving courses or workshop about hepatic encephalopathy.

Table (2) showed distribution of studied nurses according to their mean score of different items of knowledge before and after using two teaching methods.

It was observed that there was a significant differences between nurses post test knowledge in traditional lecture and web based teaching group regarding definition, precipitating factors, characteristics of the 1st and the 3rd stage of HE, conditions that may cause elevated ammonia levels, disorders that mask symptoms of HE, diet which should be avoided for the patient with HE, sedatives which should be avoided, desired effects of neomycin, agents used in reducing colonic

Table 1. Distribution of the studied nurses according to sociodemographic characteristics

Personal characteristics		Traditional lecture teaching method (n=30)		Web based teaching method (n=30)	
		N	%	N	%
Age	19-30 years	16	53.3	20	66.7
	31-38 years	14	46.7	10	33.3
	Mean±SD	29.67±5.701		28.07±5.152	
Sex	Female	30	100	26	86.7
	Male	0	0	4	13.3
Marital status	Married	22	73.3	20	66.7
	Single	8	26.7	10	33.3
Level of education	baccalaureate	18	60	20	66.7
	Technical institute	6	20	8	26.7
	Diplome	6	20	2	6.7
Years of experience	<5	10	33.3	16	53.3
	5-10	8	26.7	4	13.3
	>10	12	40	10	33.3
	Mean±SD	8.20±5.768		5.87±4.981	
Previous in serving courses or workshop about HE	yes	0	0.00	0	0.00
	No	30	100.0	30	100.0

Table 2. Distribution of studied nurses according to their mean score of different items of knowledge before and after two using teaching method

Items	Traditional lecture teaching method			web based teaching method		
	Mean±SD		t	Mean±SD		t
	Before	After	P	Before	after	P
1. Definition of HE	0.60±0.498	0.93±0.254	3.808	0.67±0.479	1.00±0.000	3.808
			0.001*			0.001*
2. Precipitating factors of HE	0.27±0.450	0.87±0.346	6.595	0.47±0.507	0.87±0.346	4.397
			0.000*			0.000*
3. Characteristics of the 1 st stage of HE	0.60±0.498	1.00±0.000	4.397	0.47±0.507	0.93±0.254	5.037
			0.000*			0.000*
4. Characteristics of the 2 nd stage of HE	0.33±0.479	0.73±0.450	3.525	0.33±0.479	0.53±0.507	1.439
			0.001*			0.161
5. Characteristics of the 3 rd stage of HE	0.60±0.498	1.00±0.000	4.397	0.73±0.450	0.93±0.254	2.693
			0.000*			0.012*
6. Conditions that may cause elevated ammonia levels include	0.20±0.407	0.67±0.479	4.065	0.33±0.479	0.73±0.450	3.525
			0.000*			0.001*
7. Most common clinical manifestation of HE	0.73±0.450	0.87±0.346	1.439	0.80±0.407	0.87±0.346	0.626
			0.161			0.536
8. Neuropsychological testing to detect the mildest form of HE	0.67±0.479	0.73±0.450	0.812	0.73±0.450	0.80±0.407	0.812
			0.423			0.423
9. Disorders that mask symptoms of HE	0.53±0.507	0.80±0.407	2.112	0.33±0.479	0.67±0.479	3.010
			0.043*			0.005*
10. Common diagnostic studies of HE	0.67±0.479	1.00±0.000	3.808	0.87±0.346	0.93±0.254	1.439
			0.001*			0.161
11. Complications of HE	0.73±0.450	0.80±0.407	0.812	0.87±0.346	0.80±0.407	0.812
			0.423			0.423
12. Lactulose is prescribed to the client with HE to	0.80±0.407	0.93±0.254	1.439	0.93±0.254	1.00±0.000	1.439
			0.161			0.161
13. Which of the following diet should be avoided for the patient with HE?	0.67±0.479	0.93±0.254	3.247	0.87±0.346	1.00±0.000	2.112
			0.003*			0.043*
14. Diet modification for patient with hepatic encephalopathy include	0.27±0.450	0.47±0.507	1.649	0.33±0.479	0.40±0.498	0.528
			0.110			0.601
15. Patients with pre HE should avoid sedatives to	0.73±0.450	0.93±0.254	2.693	0.20±0.407	0.67±0.479	5.037
			0.012*			0.000*
16. Bed rest is encouraged for patient with HE to	0.33±0.479	0.67±0.479	3.010	0.27±0.450	0.40±0.498	1.161
			0.005*			0.255
17. If the patients with HE develops diarrhea. The nurse best action when giving next dose of lactulose would be:	0.27±0.450	0.73±0.450	5.037	0.47±0.507	0.60±0.498	1.439
			0.000*			0.161
18. Desired effect of neomycin is	0.73±0.450	0.93±0.254	2.693	0.67±0.479	0.87±0.346	2.693
			0.012*			0.012*
19. Agents used in treatment of HE and reducing colonic bacterial flora	0.13±0.346	0.80±0.407	7.616	0.13±0.346	0.47±0.507	3.010
			0.000*			0.005*
20. Health teaching for patient with HE	1.67±0.884	2.00±0.743	2.065	1.60±0.724	1.87±0.819	1.352
			0.048*			0.187
21. First aid for patient with HE	1.20±0.925	1.80±0.664	3.168	1.20±0.847	1.93±0.583	3.717
			0.004*			0.001*
Total knowledge score	12.73±4.042	19.60±3.103	11.476	13.27±3.29	18.40±2.37	7.856
			0.000*			0.000*

* Significant for P 0.05.

bacterial flora and first aid for patient with HE, where $P=0.001, 0.000, 0.000, 0.012, 0.001, 0.005, 0.043, 0.000, 0.012, 0.005, 0.001$, respectively. Also it was observed that total knowledge scores of both groups were improved post completion of the teaching since mean score for traditional group was 12.73 ± 4.042 compared to 19.60 ± 3.103 and 13.27 ± 3.29 compared to 18.40 ± 2.372 for web based group before and after teaching respectively. This means that website and traditional lecture teaching methods were equally efficient in promoting the nurses' knowledge about hepatic encephalopathy. Furthermore, there was an increase in total mean knowledge score of traditional lecture teaching group than web based group post implementation of teaching method with mean of 19.60 ± 3.103 and 18.40 ± 2.372 respectively and this difference was significantly, where $P=0.000$.

Table (3) illustrated distribution of studied nurses according to their level of knowledge pre and post implementation of two teaching methods. Results revealed that more than half of nurses (53.3%) in the traditional lecture teaching group had poor knowledge level about hepatic encephalopathy in the pre-test compared with less than half (40%) of the nurses in the web based teaching group. On the other hand, about three quarter (73.3%) of nurses in traditional lecture teaching groups had good knowledge compared with less than half (40%) in the web based teaching group after completing the courses. Also it was observed that there was a significant differences in nurses' knowledge level of web based teaching group before and after the course, where $P=0.041$.

Table (4) Distribution of studied nurses according to their level of satisfaction about teaching methods. The result showed that more half (56.7%) of nurses in traditional lecture teaching group had high level of satisfaction regarding teaching method compared to one third (33.3%) of nurses in web based teaching group. However, there was statistically significant difference between both groups regarding their satisfaction level since $P=0.049$ which means that nurses who taught by traditional method were highly satisfied more than those who taught by web based method.

Table (5) revealed comparison between two teaching method in relation to nurses' total knowledge score and satisfaction level post completion of teaching course. It was found that more than half (60%) of nurses in traditional lecture teaching group who had good knowledge had high level of satisfaction with teaching method compared to one third (33.3%) of nurses in web based teaching group. It can be also revealed that there was a highly significant difference between knowledge and satisfaction level in both traditional and web based teaching group post completion of teaching method, where $P=0.000$. Thus, pre-existing differences between nurses who prefer traditional lecture teaching method and nurses who prefer web based teaching method may result in the appearance that traditional lecture is more effective than web based teaching method.

Table (6) Correlation between nurse's sociodemographic data and their total knowledge score before and after using of two methods of teaching (traditional lecture and web based)

Table 3. Distribution of studied nurses according to their level of knowledge pre and post implementation of two teaching methods

Level of knowledge	Traditional lecture teaching method (n=30)					Web based teaching method (n=30)				
	Before		After		P	Before		After		P
	N	%	N	%		N	%	N	%	
(1-12) "Poor"	16	53.3	0	0	3.153	12	40	0	0	6.389
(13-18) "Fair"	8	26.7	8	26.7	0.207	16	53.3	18	60	0.041*
(19-25) "Good"	6	20	22	73.3		2	6.7	12	40	

* Significant for $P = 0.05$.

Table 4. Distribution of studied nurses according to their level of satisfaction about teaching methods

Nurses' satisfaction level		Traditional teaching method		Web based teaching method		² P
		N	%	N	%	
Moderate (4-6)		13	43.3	20	66.7	3.300
	High (7-10)	17	56.7	10	33.3	

* Significant for $P = 0.05$

Table 5. Comparison between two teaching method in relation to nurses' total knowledge score and satisfaction level post completion of teaching course

Methods of teaching	Knowledge level	Level of satisfaction				Total		2
		(4-6) "Moderate"		(7-10) "High"				P
		N	%	N	%	N	%	
Traditional teaching method	(13-18) Fair	8	26.7	0	0	8	26.7	16.364
	(19-25) Good	4	13.3	18	60	22	73.3	
Total		12	40	18	60	30	100	0.000*
Web based teaching method	(13-18) Fair	18	60	0	0	18	60	22.5
	(19-25) Good	2	6.7	10	33.3	12	40	
Total		20	66.7	10	33.3	30	100	0.000*

Table 6. Correlation between nurse's sociodemographic data and their total knowledge score before and after using of two methods of teaching (traditional lecture and web based)

Sociodemographic data	Total knowledge score of traditional lecture teaching group				Total knowledge score of web based teaching group			
	before		after		before		after	
	R	P	R	P	R	P	R	P
Age	0.101	0.595	0.193	0.306	-0.572**	0.001*	0.577**	0.001*
Marital status	0.307	0.099	0.023	0.905	0.055	0.772	0.289	0.122
Level of education	0.222	0.239	0.573**	0.001*	0.021	0.914	0.038	0.842
Years of experience	0.079	0.680	0.159	0.402	-0.376*	0.04*	0.452*	0.043*

In this table, a highly significant correlation was observed between level of education and total knowledge score after using traditional lecture teaching method where ($R=0.573$ at $P=0.001$). This mean that highly educated nurses had high total knowledge score. On the other hand, no correlation was observed in relation to age, marital status or years of experience and total knowledge score of traditional lecture teaching group before and after teaching course. Regarding website teaching method, significant negative correlations was found between age, years of experience and total knowledge score before using the teaching method, where $R=-0.572$, -0.376 at $P=0.001, 0.04$, respectively. While a positive significant correlation was observed between age, years of experience and total knowledge score after using web based teaching method where $R=0.577$ and 0.452 at $P=0.001, 0.043$, respectively.

DISCUSSION

Healthcare professionals should be encouraged to update their knowledge and maintain clinical competence. The rapid changes taking place within healthcare systems have increased the pressure on nurses to engage in continuing education programmes. In the nursing profession, the most common aims of these programmes are to enable nurses to continue their professional growth, deliver safe and efficient care, appraise clinical practice in an innovative way and identify their own educational needs (Griscti and Jacono 2006; Wakin-Fleming 2011). Traditional lecturing is one of the oldest and the most widely used methods of teaching (Abu Hasheesh *et al.*, 2011). Although, Lecturing for a large group has the main advantage of being cost-time effective. It makes the student passive, hinders learning and has difficulty in maintaining the attention span of students. These can be overcome by integrating the methods of teaching such as group work, use of video, dividing the class into multi sessions, and 5 min mini-evaluation (Ganesan *et al.*, 2012). New advances in information technology provide improved opportunities for continuing education for nurses particularly via the web (Johnson *et al.*, 2000). Web based instruction is becoming increasingly popular in educational institutions as a tool to address the inadequacies of traditional teaching. Web Based instruction may be employed to promote experiential learning. It offers a new sensibility and means of learning, and facilitate enrollment into courses (Gowri and Minolin 2013). The present study aimed at evaluate the efficacy of two teaching methods on nurse's knowledge regarding hepatic encephalopathy. Regarding distribution of studied nurses according to their mean score of different items of knowledge before and after using two teaching method. The present study showed that nurses knowledge regarding definition, precipitating factors, characteristics of the 1st and the 3rd stage of HE, conditions that may cause elevated ammonia levels, disorders that mask symptoms of HE, diet which should be avoided to the patient with HE, sedatives which should be avoided, desired effects of neomycin, agents used in reducing colonic bacterial flora and first aid for patient with HE was improved in both traditional lecture group and web based group after completion of the educational program. This might be due to the effectiveness of teaching methods in updating of knowledge of nurses about hepatic encephalopathy. This finding was in line with

Gallagher (2000) who mentioned that continuing education has been shown to increase nurses' professional behavior and improve the knowledge of patient management and nursing practice.

Similarly, Khatony *et al.* (2009) Bata-Jones *et al.* (2004) Leasure *et al.* (2000) and Unal *et al.* (2005) concluded that the knowledge of the nurses in web-based and traditional lecture continuing education methods increased between the pre-test and the post-test, most of them scoring 'good' in the post-test and no differences between web-based and traditional lecture teaching methods regarding learning outcomes was observed. Also the present study revealed an increased of total mean knowledge score of traditional lecture group than the web-based group after completion of teaching methods with no statistical significant difference found between the two groups. This means that web-based and traditional lecture teaching methods were equally efficient in promoting the nurses' knowledge about hepatic encephalopathy. This finding was in line with Jeffries *et al.* (2003) and Salimi *et al.* (2007) they reported that no significant differences were observed between the students' scores in traditional lectures versus active methods like working in small groups or computer assisted teaching methods.

Moreover, Naismith and Steinert (2001) reported that lecture is an effective teaching method and have benefits such as clarification of difficult concepts, organization of thinking, and promotion of problem solving. In addition, Weber and Lennon (2007) mentioned that web based course is effective and equivalent to a traditional classroom environment. On the other hand, Jun and Gruenwald (2001) concluded that the effectiveness of web-based instruction is minimal because it lack of face-to-face communication existing in a traditional classroom.

Concerning distribution of studied nurses according to their level of knowledge pre and post implementation of traditional lecture and web based site teaching methods. The present study revealed that most of nurses in traditional lecture and web based group had moderate and poor knowledge level regarding hepatic encephalopathy in the pre test. This inadequacy may be attributed to insufficiency basic information during their basic nursing education and absence of pre-service and in-service training programs, which help in updating nurses' knowledge. Also many hospitals do not provide money or time for nurses to attend conferences and other continuing education events. In this respect Gillies (1994) emphasized that graduate nurses are in need to update their knowledge and require continuous in-service education program to keep abreast of changing demands and capabilities. Also the present study showed that, the majority of nurses in traditional lecture groups had good knowledge level compared with less than half of nurses in the web-based group in the post test which mean that traditional lecture teaching was more effective than web based teaching method. Same result was reported by Fletcher and Hager (2008) who emphasized that most of educational programs especially traditional methods are effective at transmitting new knowledge or delivering updates, but with little evidence that they produce change in the practice of health professionals. However, Jeffries (2005) reported that traditional method tends

to produce shallow, surface thinkers who primarily rely on rote memory rather than careful understanding of the content. On the other hand Gowri *et al.* (2013) indicated that the knowledge of students in web based group is effective than the traditional group students. Students in the web based group had the opportunity to read and understand the content by themselves and feel free to clarify the doubt but whereas in lecture method students may hesitate to ask doubt in front of others. In addition, Hansen and Stephens (2000) stated that the main weakness of the lecture method is that it allows students to be passive recipients of information that has been "predigested" by the professor. In relation to distribution of studied nurses according to their level of satisfaction about teaching methods. The findings showed that there was statistically significant difference between the two teaching methods in relation to nurses level of satisfaction whereas more than half of nurses in traditional lecture group had high level of satisfaction about teaching method compared to one third of nurses in web based group. This could be attributed to that, the web based teaching method places more responsibility for learning on the learners and many nurses may have lack of computer skills, time and interest that negatively affects their satisfaction. In addition, Delpier (2006) in his study reported a decreased comfort level with nontraditional teaching methods because they change participant role from passive to active learner. Similarly Machemer and Crawford (2007) reported that students in traditional method become dependent on the professor to tell them what they need to know and they avoid taking responsibility for their own learning. Controversially, Gerkin *et al.* (2009), Fearing and Riley (2005) Irons, Jung *et al.* 2002 and Phillips (2006) identified in their studies that the nurses reported satisfaction with the online format and commented that online learning was convenient, flexible, and useful. Also studies of nurses' experiences of web-based learning have shown increased learner satisfaction, activeness in learning, ease of access, as well as a desire to use technology for learning (Korhonen and Lammintakanen 2005; Ryan *et al.*, 1999).

Regarding comparison between two teaching method in relation to nurses' total knowledge score and satisfaction level post completion of teaching course. It was found that more than half of nurses in traditional lecture group who had good knowledge level had high level of satisfaction compared to one third of nurses in web based group. This may indicate that traditional lecture is more effective than web based teaching method. This result was in contrast with Jeffries (2001) who mentioned that the web based site group demonstrating higher satisfaction level and more cognitive gains than the lecture group. On the other hand, Jang *et al.* (2005) had conducted the study to examine the effects of a Web-based teaching method versus a traditional lecture method on undergraduate nursing students' learning of electrocardiography (ECG). They found that no significant differences between the two groups in relation to level of satisfaction with learning methods.

In relation to correlation between nurse's socio demographic data and their total knowledge score before and after using of two methods of teaching (traditional lecture and web based). The present study indicated that, there was a positive correlation regarding level of education and total knowledge

score after traditional lecture teaching whereas, the nurses with high level of education denoted adequacy of knowledge than diploma or technical institute nurses. Also the present study showed that there was a negative correlation between age, years of experience and total knowledge score before using teaching method which means that older and more experienced nurses had less total knowledge score. This could be attributed to older nurses have lack of interests to acquire knowledge, and they are over loaded in their work with more responsibilities. On the other hand, a positive correlation was observed between ages, years of experience and total knowledge score after using web based teaching method. In the same aspect, Gowri *et al.* (2013) reported that web based instruction is a rich educational resource that promotes and facilitates student learning and is increasingly being used to deliver course content in nursing. At the end, inadequacy of nurses' knowledge can be attributed to unavailability of procedure book, lack of pre-service and in-service training, lack of basic information, orientation programs, and meeting conferences. Continuing education and training program are important aspects to prepare nurses for caring with critical ill patients. Nurses must also make a personal commitment to the value of continuing education as part of their professional responsibility.

Conclusion

It can be concluded from the result of the present study that the majority of nurse's knowledge related to hepatic encephalopathy were generally inadequate. Furthermore, it is assumed that this deficiency in knowledge is due to unavailability of procedure book, no refresher courses to update knowledge of nurses, and unavailability of organized in-service training programs. Also the study revealed that web-based and traditional lecture teaching methods were efficient in improving the nurses' knowledge about hepatic encephalopathy and nurses who taught by traditional lecture were more satisfied than those taught by web site teaching method. Therefore continuing education and training program are important aspects to prepare nurses for caring with critical ill patients

Recommendation

From the above conclusions, the following recommendations are suggested:

- In-service training programs should be conducted on regular basis to improve and up-date nurses' knowledge and practice.
- Ward conference should be planned periodically in order to introduce to all health team members new advice in the field.

For further study

There's need for more research in this area of such independent nursing functions such as Assess the impact of online learning on practicing nurses and the nurse's ability to translate knowledge into clinical practice.

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