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Effect of Nursing Educational Protocol on Nurses' Knowledge and Practice Regarding Septicemia among Burned Patients

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Abstract

Background: *Patients with burn injury are highly susceptible to infection which leading to septicemia is the main cause of death.*

Aim: *To evaluate the effect of nursing educational protocol on nurses' knowledge and practice regarding septicemia among burned patients.*

Subjects and Methods: *Quasi-experimental (pre and posttest) research design utilized in this study. The study was conducted in Burn Unit at Assiut University Hospital. All available nurses working in the unit.*

Tools: Tool I *Pre and posttest interview questionnaire.* ***Tool II*** *Observational checklist sheet.*

Results: *The current study showed that, there was highly statistically significant difference between pre and post implementation of educational protocol on nurses' knowledge and practice regarding septicemia.*

Conclusion: *Nursing educational protocol had a significant effective on improving knowledge and practice for nurses regarding septicemia among burned patients*

Recommendation: *Continued nursing education and training program about septicemia and infection control measures should be organized at burn unit.*

Keywords: *Nursing Educational Protocol, Nurses' Knowledge and Practice, Septicemia, Burn*

1. Introduction

Nosocomial infection is the most common complication affecting hospitalized patients and lead to increase morbidity and mortality **(Azimi et al., 2011)**. Historically Staphylococci and beta hemolytic Streptococci were the most organisms responsible for sepsis in burn patients in earlier days **(Riaz &Babar, 2015)**. Burn is an injury to tissues caused by exposure to heat, chemicals, electricity or radiation. Infection of the burn injury leading to septicemia is the main cause of death (**Sarabahi & Tiwari, 2011)**.

Early treatment of septic episodes with proper antibiotics which preventing mortality among burn patients **(Kiran &Chetan, 2018)**. Prevention of sepsis is one of the main goals for health care giver of the patients with severe burn. There are several techniques, in addition to standard infection control measures, which reduce the risk of infection and sepsis **(Rhodes et al., 2017**).

Optimal care of the burn patient requires a distinctive multidisciplinary approach. Positive patient outcomes are dependent on the composition of the burn care team and close collaboration among its members. At the center of this team is the burn nurse possess a broad-based knowledge of critical care techniques, diagnostic studies and rehabilitative and psychosocial skills. The nurse is responsible for wound care and for noting subtle changes that require immediate attention, prevention of infection **(Greenfield, 2010)**.

2. Significance of the Study

Infection in the burned patients is the leading cause of morbidity and mortality and It is one of the greatest challenging concerns for the burn care team. So prevention and management of infection is a primary concern in the treatment of patients with severe injuries and require immediate specialized care to reduce morbidity and mortality caused by infection and septicemia (**Sarabahi & Tiwari, 2011**). Nurses have important role to prevent infection and burned

patients require knowledgeable and skilful nurse for prevention or early detection of septicemia. Therefore, this study was carried out to improve nurses' knowledge and practice regarding septicemia.

3. Aim of this Study

To evaluate the effect of nursing educational protocol on nurses' knowledge and practice regarding septicemia among burned patients.

4. Research Hypothesis:

1. Nurses will have better knowledge regarding septicemia after implementation of nursing educational protocol.
2. Nurses' practice will be improve after implementation of nursing educational protocol.

5. Subjects and Methods

Research Design: Quasi-experimental (pre and posttest) research design was utilized throughout this study.

Setting: The study was conducted in Burn Unit at Assiut University Hospital.

Subjects: All available nurses working in Burn Unit at Assiut University Hospital.

6. Tools

Tool (I): Pre and posttest interview questionnaire: This tool was to assess the level of knowledge for nurses about septicemia among burned patients. The researchers used it pre & post implementation of the Educational protocol. It consisted of two parts:

Part 1: Socio- demographic data included age, gender, marital status, qualification, address, year of experience and training courses.

Part 2: Nurses' knowledge assessment included; definition, causes, signs and symptoms, risk factors and complications of septicemia. Infection control measures during nursing care for burned patient.

Scoring System: Correct answer = 2 & incorrect answer = 1. The total scores were 46. Less than 70 % were considered unsatisfactory level of knowledge, more than 70 % were considered satisfactory level of knowledge.

Tool (II): Observational checklist sheet: It was applied by the researchers to assess the nurse's practice as regard prevention of infection, early detection and management of septicemia among burned patients. It used before and after the implementation of the educational protocol. It consisted of

1. Universal precautions which includes hand washing, using the personal protective barriers such as gloves, gown, mask & eye goggles and patient care equipment, maintain clean environment, safe injection practices.
2. Specific precautions as regards activities to prevent infection during the following procedures: cannula insertion, IV fluid infusion, blood transfusion, urinary catheter insertion, suctioning, nasogastric tube insertion and wound care.

Scoring system: (2 degrees) For correct & complete step, (1degree) for incomplete step, & (zero degree) for incorrect step. The total score for all items = 206, less than 70% were considered inadequate practice and more than 70% were considered adequate practice.

Nursing Educational Protocol

It aimed to improve nurse's knowledge and practice for prevention of infection, early detection and management of septicemia in burned patients. The nursing protocol it was designed by the researchers after extensive review of the relevant literature and based on nurse's needs assessment. It consists of three parts: **Part1:** information about septicemia including definition, signs and symptoms, causes, risk factors and complications, early detection and management of septicemia. **Part 2:** information about infection as definition of infection, chain of infection, & how to prevent infection. **Part 3:** information about universal precautions. The researchers used simple Arabic language in the educational protocol.

Ethical Considerations

Official permission was obtained to carry out the study from head of Burn and Plastic Surgery department and approval from The local ethical committee was given to conduct our study. Informed consent was obtained from nurses and the aim of the study was explained to them to obtain their cooperation. The researchers explained that participation is voluntary. Anonymity and confidentiality were assured through coding of the data.

Content Validity

It was done by 5 expertise from nursing and medicine staff who reviewed the tools and the educational booklet for clarity, relevance, comprehensiveness, understanding, applicability and easiness for administration.

Pilot Study

It was conducted on 10% (4) nurses for testing clarity, applicability, practicability and feasibility of the study tools. Analyses of the pilot study revealed that minimal modifications were required. Modifications were done accordingly, and then the tools were designed in its final format.

Procedure

A review of current and past, national and international related literature in the various aspects of the problem using books, articles, periodicals, and magazines was done. Data were collected in Burn Unit at Assiut University Hospital during the period from (December 2018 to April 2019).

The researchers explained the nature and purpose of the study and socio-demographic data was obtained from nurses. The researchers asked the nurses to fill out the pre- test knowledge questionnaire to assess their level of knowledge. the researchers assessed nurses' practice pre-test by using observational checklist sheet tool. The data were collected at morning and afternoon shifts every day by using tool (I, II).

The researchers provided nurses with educational protocol in sessions. Each session took about 30-40 minutes. After each session there was 10- 20 minutes for discussion and feedback. The researchers provided nurses with Educational booklet equipped with picture. Post-test was done for assessment of nurses' knowledge and practice regarding septicemia among burned patients after implementation of educational protocol.

Statistical Analysis

Calculations were done by means of statistical software package " SPSS". Data was tabulated and statistical analyzed It's include percentage, and chi square correlation were done between the essential parameters. P value < .05 was interpreted as a level of statistical significance for testing research hypothesis.

7. Study Results

Table 1 Shows that all of the nurses (100%) were female, more than half of them (55.0%) living in rural area, most of them (72.5) their ages ranges between 26 to 40 years old with mean (34.73 ± 4.6). (75.0%) of them were married, (75.0%) have Diploma in nursing 3yrs, about (50.0%) their years of experiences were ≥ 10 years, and most of them (75.0%) received infection control training.

Table1. *Distribution of demographic characteristics of the studied nurses (n=40)*

Socio demographic data	No. (n=40)	%
Gender:		
Male	0	0.0
Female	40	100.0
Address:		
Urban	18	45.0
Rural	22	55.0
Age:		
16 – 25	10	25.0
26 – 40	29	72.5
> 40	1	2.5
Mean ± SD	34.73 ± 4.6	
Range	22 – 57	
Qualification:		
High nursing	0	0.0
Technical institute	10	25.0
Diploma nursing 3yrs	30	75.0
Year of experience:		
1 to > 3 years	10	25.0
5 to < 10 years	10	25.0
≥ 10 years	20	50.0
Marital status:		
Single	10	25.0
Married	30	75.0
Infection control training:		
Yes	30	75.0
No	10	25.0

Table2. *Comparison between pre and post implementation of educational protocol regarding nurses' knowledge about septicemia and infection control measures.*

Items	Nurses' Knowledge (pre) (n=40)						Nurses' Knowledge (post) (n=40)						P-value
	Correct				incorrect		Correct				incorrect		
	Complete		Incomplete				Complete		Incomplete				
	N	%	N	%	N	%	N	%	N	%	N	%	
Knowledge about: - Septicemia	4	10.0	26	65.0	10	25.0	29	72.5	8	20.0	3	7.5	0.0001 ***
- Infection control measures.	1	2.5	25	625	14	35	29	72.5	10	25.0	1	2.5	0.0001 ***

Chi-square test p. value < 0.05 Ns: non significant

Table 3 Shows There are highly statistically significant differences between pre and post implementation of educational protocol regarding nurses' practice.

Table3. *Comparison between pre and post implementation of educational protocol regarding nurses' practice.*

Items	pre test (n=40)						Post test (n=40)						
	Done				Not Done		Done				Not Done		P-value
	Correctly		Incorrectly				Correctly		Incorrectly				
	N	%	N	%	N	%	N	%	N	%	N	%	
- Universal precautions	4	10.0	25	62.5	11	27.5	27	67.5	10	25.0	3	7.5	0.0001 ***
- Specific precautions	1	2.5	29	72.5	10	25.0	20	50.0	9	22.5	11	27.5	0.0001 ***

*Chi-square test p. value < 0.05 *** significant*

Table 4 Shows there are non statistically significant differences between nurses' knowledge and Socio demographic data

Table4. *Relationship between nurses' knowledge (post-test) and Socio demographic data (N=40)*

Socio demographic data	Satisfactory (n= 34)		Unsatisfactory (n= 6)		
	No.	%	No.	%	
Gender:					-
Male	-	-	-	-	
Female	34	85.0	6	15.0	
Address:					0.476 Ns
Urban	14	35.0	4	10.0	
Rural	20	50.0	2	5.0	
Age:					0.816 Ns
16 – 25	8	20.0	2	5.0	
26 – 40	25	62.5	4	10.0	
> 40	1	2.5	0	0.0	
Qualification:					0.589 Ns
High nursing	-	-	-	-	
Technical institute	8	20.0	2	5.0	
Diplom nursing 3yrs	26	65	4	10.0	
Experience level:					0.308 Ns
1 to > 3 years	8	20.0	2	5.0	
5 to < 10 years	10	25.0	0	0.0	
>= 10 years	16	40.0	4	10.0	
Marital status:					0.481 Ns
Single	9	22.5	1	2.5	
Married	25	62.5	5	12.5	
Attending training:					0.589 Ns
Yes	26	65.0	4	10.0	
No	8	20.0	2	5.0	

Chi-square test p. value < 0.05, Ns non significant

Table 5 Shows there are a highly statistically significant differences between nurses' practice and Socio demographic data.

Table5. *Relationship between nurses' practice (post-test) and Socio demographic data*

Socio demographic data	Adequate (n= 30)		inadequate (n= 10)		P- value
	No.	%	No.	%	
Gender:					0.0001 ***
Male	-	-	-	-	
Female	30	75.0	10	25.0	
Address:					0.0001 ***
Urban	13	32.5	5	12.5	
Rural	17	42.5	5	12.5	
Age:					0.0001 ***
16 – 25	8	20.0	2	5.0	
26 – 40	21	52.5	8	20.0	
> 40	1	2.5	0	0.0	
Qualification:					0.0001 ***
High nursing	-	-	-	-	
Technical institute	8	20.0	2	5.0	
Diploma nursing 3yrs	22	55.0	8	20.0	
Experience level:					0.0001 ***
1 to > 5 years	8	20.0	2	5.0	
5 to < 10 years	8	20.0	2	5.0	
>= 10 years	14	35.0	6	15.0	
Marital status:					0.0001 ***
Single	8	20.0	2	5.0	
Married	12	30.0	8	20.0	
Attending training:					0.0001 ***
Yes	28	70.0	2	5.0	
No	2	5.0	8	20.0	

*Chi-square test p. value < 0.05 ***highly significant*

Figure 1 Illustrates that most of nurses were unsatisfactory knowledge level (87.5%) pre educational protocol, however post educational protocol were satisfactory knowledge level (85%).

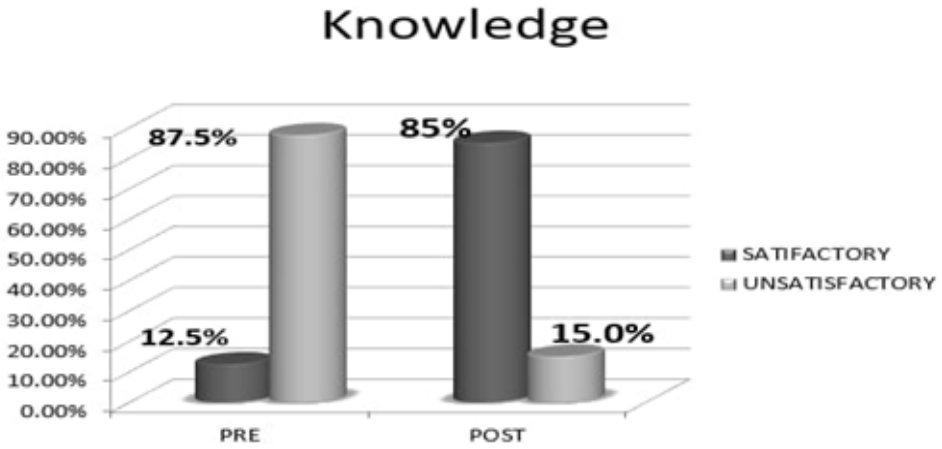

Figure1. *Distribution of total Knowledge level of nurses regarding septicemia and infection control measures.*

Figure 2 Shows; all nurses were inadequate practice (100%) pre educational protocol, however post educational protocol most of them were adequate practice (75%).

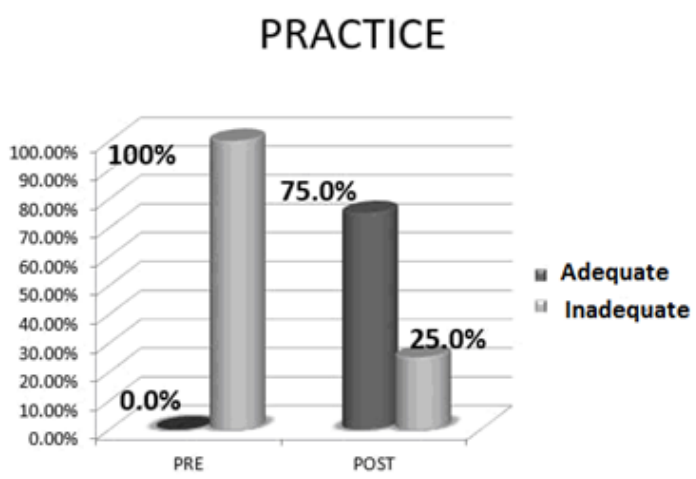

Figure2. *Distribution of total practice level of nurses*

Figure 3 Shows a positive correlation between nurses' knowledge and practice after implementation of the educational protocol.

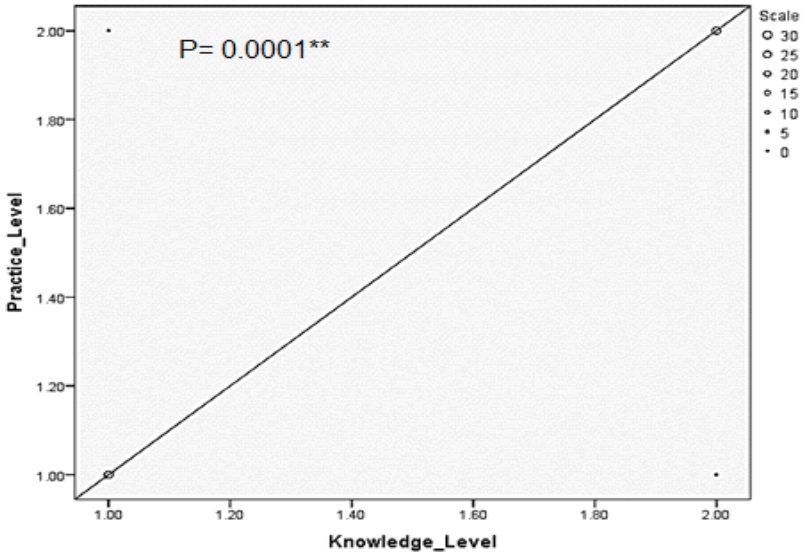

Figure3. *Relation between nurses' knowledge and practice*

8. Discussion

Sepsis is a major cause of death worldwide and remains the subject of much research. Despite advances in burn prevention, treatment, and rehabilitation, sepsis remains a common cause of death in a severe burn injury patients **Rowan et al., (2015).** Infection control nurses play an important role in burn unit. Therefore assessment of nurses' knowledge level and practice about infection control technique is important to control infection in burn unit.

Mohammed, (2016) Prevention and management of infection is a main concern in the treatment of burned patients. As strict aseptic techniques, proper use of personal protective equipment's and proper hand washing **Hospenthal, Green, Crouch, et al., (2011).** The current study showed that, all of the nurses were female, more than half of them living in rural area, most of them their ages between 26 – 40 years old, mean age 34.73 ± 4.6. most of them were married, have diploma in nursing 3yrs, about their years of experiences were ≥ 10 years, and most of them received infection control training.

This study result was in the same line with **Khalil and Abd El-All, (2019)** who reported that the majority of the nurses were females, married, had diploma of nursing, and the majority of them had infection control training. It consistent with the study of **Moussa and Shahin, (2015)** entitled as "Evaluation of an educational protocol on nurses' knowledge and practice regarding standard precautions of infection control measures in outpatients clinics".

The present study showed that most of nurses were unsatisfactory knowledge level pre educational protocol, however post educational protocol were satisfactory knowledge level. There are highly statistically significant differences between pre and post implementation of educational protocol regarding nurses' knowledge about septicemia and infection control measures. This study finding is in the same line with **Mohammed, (2016)** who reported that most of the study had satisfactory level of knowledge regarding nosocomial infection after implementing protocol. This study finding supported by **Galal, Labib, Abouelhamd, (2014)** who revealed that improvement in total score knowledge after implementation of protocol among the nursing staff.

Our current study clarified that all nurses were inadequate practice pre educational protocol, however post educational protocol most of them were adequate practice. There are highly statistically significant differences between pre and post implementation of educational protocol regarding nurses' practice. Those findings is supported by **Rothensal et al., (2012)** they found that the educational protocols about the infection control precautions are significantly influenced the participants performance.

Similarly **Mohamed, (2010)** reported that, immediately after the protocol implementation most of nurses had a good score in their knowledge and skill. In addition **El-Sayed et al., (2015)** Concluded that the burned patients at high risk of developing life threatening problems as infection. The nurse plays a crucial role in preventing infection among the burned patients. Most of nurses providing care for those patients have low level of practice. Therefore nurses should be follow the nursing guide lines to enhance the quality of nursing care. Also **Mussa and Abass, (2014)** stated that training protocol about infection control measures to all members of staff lead to understand the infection control procedure.

The current study illustrated a positive correlation between nurses' knowledge and practice after implementation of the educational protocol. Which means that improvement of nurses' knowledge reflected on improvement of nurses' practice. The results of the present study are in agreement with **Mohamed and Wafa, (2011)** stated that there was a positive significantly correlation between nurse's practice and knowledge pre and post implementation of infection control protocol. The finding of this study was in agreement with the study conducted by **Mohamed, (2016)** revealed that a positive correlation between improvement of knowledge and practice post implementation of nursing guidelines.

Our study showed there are non statistically significant differences between nurses' knowledge and Socio demographic data it consistent with **El-Sayed et al., (2015)** clarified that no significant relation between nurses' experience and their knowledge scores. The current study showed there are a highly statistically significant differences between nurses' practice and Socio demographic data. This study finding supported by **Fayed et al., (2016)** who reported that there are a highly statistical significant difference between nurse's practices and their socio demographic. In addition **Elewa et al., (2017)** stated that there were statistically significant correlations between total nursing practice scores and age, years of experience and educational level.

9. Conclusion

Based on the results of the present study, it can be concluded that: nursing educational protocol had a significant effective on improving knowledge and practice for nurses regarding septicemia.

Recommendation

1. Continuous Training and educational courses should be Provided to nurses in burn unit to increase their knowledge and practice regarding prevention of infection, early detection and management of septicemia.
2. Replication of the study on a large probability sample from different geographical areas in Egypt to figure out the main aspects of this problem.

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