

Assessment of Critical Care Nurses' Performance Regarding Eye Care for Critically Ill Patients

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Abstract

Background: Critically ill patients usually have a wide range of life-threatening systemic disorders that may obscure relatively “minor” ocular problems and so Life-sustaining procedures take precedence in ICU. The critical care nurses and multidisciplinary teams’ lack of knowledge about the anatomy and physiology of the ocular system, ocular assessment, and the optimum eye care measures may contribute to the occurrence of ocular problems. **Aim:** This study aimed to assess critical care nurses' performance regarding eye care for critically ill patients. **Research design:** A descriptive research design was used to conduct this study. **Sample:** A purposive sample of 50 critical care nurses in Beni-Suef University Hospital’s intensive care units. **Setting:** This study was conducted in Beni-Suef University Hospital’s intensive care units. **Tools:** Three tools were used for data collection (1) Self- Administered Questionnaire, which covered the socio-demographic characteristics of the studied nurses, (2) Eye Care Competence Inventory which included (a) Knowledge Assessment, (b) Attitude Assessment, (3) Eye Care Practices Assessment Sheet which included (a)Methods and techniques of eye care, (b) Eye care practices observational checklist. **Results:** This study revealed that; about 74 % of the studied nurses had unsatisfactory level of knowledge regarding eye care, while about 92 % of the studied nurses had negative attitude regarding eye care and about 6 % of the studied nurses had satisfactory level of practice regarding eye care. **Conclusion:** the critical care nurses’ performance regarding eye care needs special educational program to provide optimum eye care. **Recommendations:** Continuous In-service training programs for critical care nurses are recommended to improve their performance regarding eye care.

Key words: *Critical care nurses’ performance, Critically ill patients, Eye Care.*

Introduction

Critically ill patients usually have a wide range of life-threatening systemic disorders that may obscure relatively “minor” ocular problems and so Life-sustaining procedures take precedence in ICU. Eye care is a minor consideration for ICU patients, despite the fact that those patients are more susceptible to a variety of ophthalmic conditions. If timely and appropriate treatment is not provided, the consequences of ocular surface disorders (OSDs), destruction of ocular contents, and ocular complications can be rapid, severe, and result in vision loss. Analgesics and sedatives are commonly given to critically ill patients to alleviate pain and anxiety, enable invasive treatments and endotracheal tube tolerance, reduce stress and oxygen use, and improve mechanical ventilation synchrony (Ebadi et al., 2021).

The blink reflex and the Orbicularis oculi muscles of the eye are frequently affected by sedatives and Neuro Muscular Blocking Agents, and the eyelid may appear to be closed. However, lagophthalmos can occur, causing the mucosal surface of the eye to dry out, increasing the risk of exposure keratopathy and microbial keratitis. Mechanical ventilators commonly affect eye health condition and induce conjunctival edoema, or "chemosis.". Conjunctival edema increases the risk for developing ocular surface complications. Poor performance of the critical care nurses regarding eye care may also enhance occurrence of ocular complications (Momeni Mehrjardi et al., 2021).

Eye care is a significant aspect of the caring process of critically ill patients but often neglected due to continuous focus on the life-threatening situations in this group of patients. Furthermore, formalized eye care guidelines and protocols, when incorporated in patient care plans, can significantly reduce the rate of Exposure keratopathy. It seems to be a consensus among researchers that a systematic, targeted eye care program in the ICU, along with increased knowledge and empowerment of nurses, can prevent corneal and ocular surface problems or overall eye complications in the ICU setting (Ahmadinejad et al., 2020)

Aim of the study

The aim of the current study was to assess critical care nurses' performance regarding eye care for critically ill patients through:

- Assess critical care nurses' knowledge regarding eye care
- Assess critical care nurses' practice regarding eye care
- Assess critical care nurses' attitude regarding eye care.

Significance of the study

Critical care nurses' primary aim is to save the patient's life. Eye care is usually overlooked in the management of critically ill patients. Critical care nurses are usually overwhelmed by life-saving procedures and dismiss ocular infection as a minor issue; but, if an eye is neglected, it can deteriorate and cause ocular problems. In critically ill patients, ocular problems can range from a minor conjunctival infection to a significant corneal infection and injury such as corneal abrasion, ulceration, perforation, and vision loss (Yu et al., 2021). Ocular surface disorders are common in critically ill patients with 8.8 % of patients had corneal ulcer and corneal abrasion was found in 26.7 % of patients in intensive care unit of Beni-Suef University Hospital (Sayed,2018)

Subject and methods

Research design: A descriptive research design was used in this study.

Setting of the study: This study was conducted in Beni-Suef University Hospital; Intensive Care Units.

Subject: A purposive sample of 50 critical care nurses in Beni-Suef University Hospital intensive care units were selected based on inclusion criteria.

Inclusion criteria:

- At least one year experience in intensive care unit.

Tools of data collection

Data were collected using the following tools:

Tool I: Self- Administered questionnaire:

This questionnaire was adapted from (Alghamdi et al., 2018) and was used to evaluate the demographic characteristics of study subjects including age, gender, educational level, years of experience in critical care unit, type of ICU, and any previous special training for eye care.

Tool II: Eye care competence inventory (ECCI)

This tool adapted from (Ebadi et al., 2017) to assess critical care nurses' knowledge and attitudes on eye care for patients in intensive care units It is divided into two parts and written in plain Arabic and consists of two parts:

Part 1: Knowledge Assessment:

This part is comprised of 17 multiple choice questions for the assessment of knowledge about eye care and iatrogenic eye conditions (causes, treatment and nursing practices) in critically ill patients. **Scoring system:** Each correct answer was given one degree and the incorrect answer was given zero. The total score of knowledge, based on statistical review; it was considered that:

- $\geq 60\%$ Satisfactory level of knowledge (11 – 17)
- $< 60\%$ Unsatisfactory level of knowledge (0 – 10).

Part 2: Attitude Assessment: This part is designed to assess attitudes towards the importance of eye care nursing procedures. Based on statistical review; Scores $\geq 60\%$ indicate high agreement or positive attitude, while scores $< 60\%$ indicate low agreement or negative attitude.

Tool III: Eye care practices Assessment sheet:

This tool adapted from Güler et al. (2016) to assess current practices in eye care and their frequency and consist of two parts:

- **Part 1: Methods and techniques of eye care:** This part is comprised of seven items to assess methods and techniques used for eye care.

- **Part 2: Eye care practices observational checklist:** This part is comprised of 13 items to assess the practices of the studied nurses regarding eye care. Scoring system for tool III: This tool is comprised of 20 items. Minimum and maximum scores range 0-61 with higher score indicates more competent practice.

Scoring system was based on statistical review as the following:

- $\geq 75\%$ Competent level of practice (47 – 61)
- $< 75\%$ Incompetent level of practice (0 – 46)

Validity:

Face and content was ascertained by (5) experts: professors of medical surgical nursing from faculty of nursing, Sohag University, professor of medical surgical nursing from faculty of nursing, Banha University and professors of ophthalmology from faculty of medicine, Beni-Suef University who reviewed the content of the tools for clarity, relevance, comprehensiveness, accuracy and applicability, some modifications were done.

**Reliability:**

Tools were examined for their internal consistency by using Cronbach's coefficient alpha which is a model of internal consistency and the reliability levels were (0.986, 0.977) for Tool II and (0.963) for Tool III. Statistical equation of Cronbach's coefficient alpha normally ranges between 0 and 1; higher values (more than 0.7) denote acceptable reliability.

Ethical considerations:

An approval was taken to carry out the study from the ethical committee of the faculty of nursing, Helwan University. An official permission for conducting the study was obtained from administrative and responsible personnel after explaining the purpose and scope of the study and submission of a formal letter from the faculty of nursing Helwan University. Informed consent to participate in the study was obtained from nurses during the initial interview after explaining the nature, purpose, and benefits of the study, as well as the fact that there are no risks expected from the study, that participation is voluntary, and that participants have the option to withdraw at any time. The researcher assured maintaining anonymity and confidentiality of the subject data.

Pilot study

A pilot study was carried out on 10% (6 nurses) of the subjects to test applicability, feasibility, practicability of the tools, and then the necessary modifications were done. The nurses who participated in the pilot study were replaced with others in the study sample.

Field work

The actual process of data collection for this study was carried out in the period from July (2020) until the end of July (2021). The investigator attended the hospitals 2 days per week. First, the researcher introduced herself to the nurses in the intensive care units and the researcher explained the aim and objectives of study to the participant. The researcher used Tool III to assess critical care nurses' practice regarding eye care. Tool I and Tool II are administered to studied nurses to assess critical care nurses' Knowledge and attitude regarding eye care.

Statistical analysis

Statistical presentation and analysis of the present study was conducted, using Pearson Correlation test, ANOVA test and Chi-square tests. A significant level value was considered when p- value $<0.05^*$ while p- value >0.05 indicate non-significant result.

Results

Table (1) showed the demographic characteristics of the studied nurses. Regarding to age, 78 % of them were from 20-<30 years old. As regard to gender, the results revealed that 84 % of them were female. While 60 % of them worked in general ICU and no one of them had training courses for eye care before.

Table (2) revealed that; about 74 % of studied nurses didn't know risk factor for eye disorders and about 80 % of them didn't know factors aggravate Chemosis. While; 76 % of studied nurses didn't know the best endotracheal suctioning technique to prevent eye complications and about 74 % of them didn't know the key objective of eye care.



Table (3) showed that; about 88 % of studied nurses weren't performing eye assessment and about 80 % of studied nurses weren't applying eye care. In relation to methods of eye covering; none of the studied nurses were applying eye covering.

Table (4) showed that; there were 2% of studied nurses had responded very high regarding the effect does pre and post-procedure hand washing have on preventing or reducing the incidence of eye disorders, 4% of them priority do they give to eye care in patients receiving mechanical ventilation and 2% of the studied nurses had responded very high regarding the effect does standard endotracheal suctioning have on reducing the incidence of eye disorders

Table (5) revealed that; regarding level of knowledge about 74 % of the studied nurses had unsatisfactory level of knowledge regarding eye care, while about 92 % of the studied nurses had negative attitude regarding eye care and about 10 % of the studied nurses had satisfactory level of practice regarding eye care.

Table (6) revealed that; there was a strong positive relationship between the total knowledge score and the total practice score with p value (0.000). Also, there was a strong positive relationship between the studied nurses' attitude and their total practice score with p value (0.000). In addition, this table illustrated that; there was a strong positive relationship between the studied nurses' attitude and their total knowledge score with p value (0.000).

Table (1): Demographic characteristics among the studied nurses (N=50)

Demographic characteristics	No.	Percentage (%)
Age (years)		
20-<30	39	78.0
30-<40	11	22.0
Gender		
Male	8	16.0
Female	42	84.0
Education		
Technical nurse	19	38.0
Bachelor nurse	31	62.0
Experience (years)		
1-<3	10	20.0
3-<5	22	44.0
5-<10	6	12.0
>=10	12	24.0
ICU Type		
Medical	11	22.0
General	30	60.0
Cardiac	9	18.0
Eye Care Training Courses		
No	50	100.0

Table (2) Distribution of the studied nurses' level of knowledge regarding Eye care (N=50)

Items	Correct		Incorrect	
	No.	%	No.	%
Which of the following factors disturbs blink reflex?	30	60	20	40
Which of the following choices is a potential risk factor for eye disorders?	13	26	37	74
What is the most important criterion in assessing eye disorders in ICU?	32	64	18	36
Which factors aggravate Chemosis?	10	20	40	80
The best time for beginning and administrating eye care for patients hospitalized in ICU is	10	20	40	80
How often should patient be assessed regarding the protective mechanisms of the eye (ability to blink, etc.)?	33	66	17	34
How should endotracheal suctioning be performed to prevent eye complications?	12	24	38	76
What is the proper way for cleansing patient's eyes?	27	54	23	46
What is the appropriate size for eye pads and covers?	30	60	20	40
How should eye care be provided for a patient who can blink and close his eyes completely?	12	24	38	76
What is the best eye care for a patient who cannot close his eyes and his sclera exposed?	12	24	38	76
How should eye care be given to a patient who receives mechanical ventilation and sedative agents?	11	22	39	78
The key objective of eye care is?	13	26	37	74
The best eye care plan is	35	70	15	30
Which of the following methods is the most effective for preventing corneal abrasion?	12	24	38	76
Eye cleansing by distilled water	13	26	37	74
What is the right direction for applying adhesive tape on eyelids for closing the eyes?	14	28	36	72

Table (3) Distribution of the studied nurses' eye care practices (N=50)

Items	Pre	
	No.	%
1. Frequency of eye assessment		
– None	44	88
– Every 2hrs	0	0
– Every 4hrs	0	0
– Every 6hrs	0	0
– Every 8hrs	6	12
– Every 12hrs or more	0	0
2. Frequency of eye care		
• None	40	80
• Every 2hrs	0	0
• Every 4hrs	0	0
• Every 6hrs	0	0
• Every 8hrs	4	8
• Every 12hrs or more	6	12
3. Technique of eye care		
• None	40	80
• Open chamber technique	10	20
• Closed moisture chamber technique	0	0
• Combined technique (covering after eye cleansing, application of eye lubricants)	0	0
4. Eye cleansing		
• None	40	80
• By using normal saline 0.9%	3	6
• By using distilled water	0	0
• By using tap water	7	14
5. Methods of eye lubrication		
• None	44	88
• By using eye drops	6	12
• By using eye gel	0	0
6. Methods of eye covering		
• None	50	100
• Eye patch	0	0
• Polyethylene film	0	0
• Swimming goggles	0	0
7. Closing the eyelid by using adhesive tape		
• No	50	100

Table (4) Percentages of the studied nurses' attitude regarding Eye care (N=50)

Items	(%)				
	1	2	3	4	5
1. How much effect does pre and post-procedure hand washing have on preventing or reducing the incidence of eye disorders?	6.0	18	70	4	2
2. How much importance does eye care have for patients receiving mechanical ventilation?	10	70	12	6	2
3. How much priority do you give to eye care in patients receiving mechanical ventilation?	10	76	6	4	4
4. How much willingness do you have to provide eye care for patients receiving mechanical ventilation?	10	76	6	4	4
5. How much effect does staff education in terms of eye care have on preventing eye disorders?	10	70	12	6	2
6. How much effect does eye care have on preventing eye disorders?	6	18	70	4	2
7. How much effect does standard endotracheal suctioning have on reducing the incidence of eye disorders?	76	10	8	4	2

1= Very low, 2= Low, 3= Moderate, 4= High, 5= Very high.

Table (5) Total scores of knowledge, attitudes and practices among the studied nurses (N=50)

Items	No.	%
Knowledge		
Unsatisfactory	37	74.0
Satisfactory	13	26.0
Attitudes		
Negative	46	92.0
Positive	4	8.0
Practices		
Unsatisfactory	45	90
Satisfactory	5	10

Table (6) Correlation between Knowledge, Attitudes and Practices among Studied Nurses.

Items	Knowledge	Attitudes
Attitudes		
R	0.507	
Sig.	0.000**	
Practices		
R	0.945	0.656
Sig.	0.000**	0.000**

r Pearson Correlation test

** Highly statistical significant at $p \leq 0.01$

Discussion

Concerning the demographic characteristics of the studied nurses; in the current study; most of the studied nurses were female, all of them were aged less than 40 years old and none had passed an eye care training courses. Also; about two thirds of them had less than 5 years of experience. This is similar to **Ebadi et al. (2021)** entitled “Evaluating Intensive Care Nurses' Clinical Competence in Eye Care; a Cross-Sectional Descriptive Study” in which the majority of the nurses in the study were female, under 40 years old, and had bachelor's degrees in nursing.

Concerning the critical care nurses' performance regarding eye care; the current study illustrated that more than two thirds of nurses had unsatisfactory level of knowledge regarding eye care. This might be due to that; there had never been an educational program regarding eye care provided before in their work settings. This is in agreement with **Jaafar and Al-Jubouri (2020)** which about “Nurses' Knowledge based on Evidence Based Practice toward Eye Care for Intensive Care Units Patients” and with **Ebadi et al. (2021)** which entitled “Evaluating Intensive Care Nurses' Clinical Competence in Eye Care; a Cross-Sectional Descriptive Study” in which the total mean of score of nurses' knowledge in their studies was poor because specialized intensive care courses mainly focus more on the assessment and management of life threatening conditions rather than eye care.

In the current study; more than two thirds of studied nurses didn't know risk factors for eye problems. This is in agreement with **Milutinović et al. (2017)** entitled “Eye care in mechanically ventilated critically ill adults: nursing practice analysis” in which most of studied nurses did not know the causes for corneal abrasions in mechanically ventilated critically ill patients. Also; in the current study; more than two thirds of them didn't know the right technique of endotracheal suction. This is in agreement with **Plaszewska-Żywko et al. (2021)** entitled “Risk Factors of Eye Complications in Patients Treated in the Intensive Care Unit” which reported that suction done over the patient's head across the eyes can cause contamination of the ocular surface this may enhance ocular infection.

Also, in the current study; it is noted that the majority of studied nurses had unsatisfactory level of practice regarding eye care. This can be attributed to critical care nurses' greater involvement with managing life-threatening conditions and maintaining the functions of vital organs and their subsequent little attention to eye care. Also this could be due to absence of evidence based eye care protocol in their work settings and lack of in-service training programs regarding eye care for critically ill patients. This agree with **Khalil et al. (2019)** which about “Critical care nurses' knowledge and practices concerning eye care of patients at two teaching university hospitals, Egypt” who found that nurses' practices scores in their study were unsatisfactory.

In relation to critical care nurses' attitudes regarding eye care, the results of the current study illustrated that, the majority of studied nurses had negative attitude regarding eye care. This could be due to considering eye care is not lifesaving procedure among the whole health team members and reduced knowledge about the importance of eye care in reducing ocular surface disorders in critically ill patients. This is consistent with

(Milutinović et al., 2017) which about “Eye care in mechanically ventilated critically ill adults: nursing practice analysis” reported that Total average score of knowledge, attitude and every-day practice in their study pointed out that further improvement in the quality of eye care is needed in mechanically ventilated patients.

In the current study; only few nurses consider eye care as the first priority while providing care for patients receiving mechanical ventilation. This could be due to that decreases awareness about the most dangerous ocular complications in critically ill patients. This in agreement with **Alghamdi et al. (2018)** entitled “Assessment of intensive care nurse knowledge and perception of eye care practice for unconscious and mechanically ventilated patients in intensive care units in Saudi Arabia” in which very few nurses reported performing eye care as the first task and gave eye care the first priority while managing the comorbidities of their patients.

Also; the current study revealed that there was a strong positive relationship between critical care nurses’ knowledge and their practices. This could be due to the application of the gained knowledge into the clinical practice. This is consistent with **Vyas et al. (2018)** entitled “Knowledge and practice patterns of Intensive Care Unit nurses towards eye care in Chhattisgarh state” found that improving awareness in nurses may lead to improved eye care delivery in comatose patients on mechanical ventilation. This is disagree with **Ebadi et al. (2021)** entitled “Evaluating Intensive Care Nurses' Clinical Competence in Eye Care; a Cross-Sectional Descriptive Study” found that while their participants had limited eye care knowledge, they followed a good eye care practice. This could be due to that they used a self-report questionnaire that subjectively evaluated nurses' eye care practice.

Conclusion

On the light of the current study results, it can be concluded that, critical care nurses’ performance regarding eye care was unsatisfactory, there is a need for special educational program for critical care nurses to provide optimum eye care.

Recommendations

- Replication of the study in different ICU settings in Egypt on larger probability samples to help in generalizability of findings.
- More researches are needed to be applied to evaluate the effectiveness of applying educational program regarding eye care on patients’ outcomes.

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