Original Research Article

Predictors of Nurses' Practice of Eye Care for Patients in Intensive Care Units

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Abstract

Introduction: Taking care of patients' eyes is an important nursing skill. Nurses must be capable of providing a standard assessment of the eye and vision as well as necessary care such as eye cleaning. Intensive care unit (ICU) nurses typically focus on life-threatening issues while giving little attention to other serious issues. The purpose of this study was to assess predictors of nurses' practice of eye care for patients in ICUs in the West Bank.

Method: A cross-sectional study was conducted with all ICU nurses from West Bank hospitals. The researchers developed a self-administered questionnaire to collect data.

Results: One hundred and fifty-two nurses participated in this study. The findings revealed that the mean age of nurses was 31.2 (*SD* = 7.5) years. The analysis revealed that only 0.7% had a good knowledge level, 7.2% had a fair knowledge level, and 25.7% had a good practice level of eye care for patients in an ICU. Knowledge of patients' eye care in the ICU, as well as an eye care protocol or policy for unconscious patients, was found to be significant predictors of practice ($p < .001$).

Conclusion: The study confirmed that the nurses had poor knowledge and inadequate practice of eye care for patients in the ICU. Also, the study confirmed that a nurse's knowledge of patients' eye care in the ICU and an eye care protocol or policy for unconscious patients were significant predictors of practice.

Introduction

Taking care of patients' eyes is an important nursing skill. Nurses must be able to provide a baseline assessment of the eye and vision as well as provide necessary care such as eye cleaning (Batran et al., 2022; Gwenhure & Shepherd, 2019). Unfortunately, intensive care unit (ICU) nurses typically focus on life-threatening issues while giving little attention to other serious issues (Burns & Day, 2012; Güler et al., 2016). Patients hospitalized in the ICU who are unconscious or comatose and require mechanical ventilation are particularly vulnerable to comorbidities unrelated to their medical illness, such as bed sores, aspiration pneumonia, sepsis, and exposure keratopathy (Grixti et al., 2012; Shahin et al., 2008). In these cases, the prevalence of exposure keratopathy ranges from 3.6% to as high as 60% (Grixti et al., 2012). The most common cause of exposure keratopathy is insufficient lid closure, which results in dryness of the lower part of the cornea. Exposure keratopathy is generally bilateral in an ICU setting, and if not treated appropriately, patients are predisposed to infective keratitis.

These infections are nosocomial and difficult to treat due to widespread antibiotic resistance. Moisture chambers, lubricant eye solutions, patching of the eyes, and polyethylene coverings have all been explored as ways to avoid exposure keratopathy (Alansari et al., 2015; Kalhori et al., 2016; Zhou et al., 2014).

Ocular surface disease was observed to occur in up to 60% of patients with severe illness; the major mechanism was thought to be caused by lagophthalmos or insufficient eyelid closure (Johnson & Rolls, 2014). In ICU patients, ocular problems such as conjunctivitis, corneal abrasions, and corneal ulcers vary from 42% to 60% (Narmawala & Jani, 2017). A previous study found that the frequency of eye diseases in ICU patients ranged from 3.6% to 89.3%,

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and the proportion of patients with corneal abrasion ranged from 3% to 60%. The occurrence of ocular problems in ICU patients occurred 6.8 days after admission to the ICU on average (Cho et al., 2017).

Review of Literature

Johnson and Rolls (2014) developed guidelines to provide best practice recommendations for evidence-based treatment and care to critical care clinicians that could be transferred and applied. Furthermore, a universal protocol for preventing ocular complications in critically ill patients should be followed (Comisso et al., 2018).

When a patient is exposed to a critical condition and admitted to the ICU, the level of consciousness may have altered due to the possibility of using sedative drugs for mechanical ventilation. This change may affect the natural eye protection mechanism by impairing the mechanism of blinking and closing the eyes, as well as the tear production mechanism. When the patient's eyes are unprotected, the risk of injuries is possible (Dawson, 2005). Any injury to the corneal surface, such as scar tissue formation or opacity, can limit the quantity of light entering the eye and change its refractive power, resulting in vision loss. Severe corneal injuries can result in permanent blindness. In the critical care situation, where patients are frequently unable to notify nurses and other healthcare professionals of possible ocular issues, the prevention, identification, and management of such diseases are crucial. As a result of the continuous focus on life-threatening conditions in critically ill patients, a lack of knowledge and the need to pay attention to eyes, and the lack of a written protocol or specific guidelines to follow for eye care in this situation, patients' eyes may be neglected during nursing care (Burns & Day, 2012). However, research findings show that ICU nurses have limited knowledge and competencies in eye care (Ebadi et al., 2021). Also, there was no relationship between nurses' demographic characteristics and their knowledge and practice of eye care for unconscious patients in ICUs (Alghamdi et al., 2018; Puspasari, 2019).

Objective of the Study

To assess predictors of nurses' practice of eye care for patients in ICUs in the West Bank.

Independent variables: Knowledge, gender, age, educational level, history of family members suffering from eye problems, nursing working experience, ICU experience, previous training in eye care courses, number of patients per shift, number of ventilated patients per shift, availability of an eye care protocol or policy for unconscious patients.

Dependent variables: Eye care practice

Method

Design and Setting

The study design was a quantitative, cross-sectional study. A self-administered questionnaire was used to collect data. The West Bank has 14 public hospitals with a total capacity of 1,664 beds. The ICUs beds are 63 beds and a staff of 165 nurses. The targeted participants were all nurses working in ICUs in West Bank hospitals.

Sample and Sampling Method

The total number of nurses who work in targeted ICUs is approximately 165. The RaoSoft program was used to calculate the sample size, which had a 95% confidence level (CI), a 5% margin of error, and a 50% response rate. A total sample of 116 participants was needed to conduct this study. The nurses who completed the questionnaires were among 152 participants.

Inclusion and Exclusion Criteria

All nurses (practical and staff nurses) who work full-time in the targeted ICUs have a minimum of one year of experience and are able to speak, read, and understand Arabic. The exclusion criteria were working in managerial positions and not working in ICU.

Research Question

What are the predictors of nurses' practice of eye care for patients in ICUs in the West Bank?

Study instrument: The questionnaire consisted of the following parts:

Demographic data and work conditions were developed by the researchers for research purposes. It includes age, gender, educational level, do you have any member of your family suffering from an eye problem, work experience in nursing, work experience in ICU, do you have previous training for an eye care course, how many patients do you take care of per shift, how many ventilated patients do you take care of per shift, and do you have an eye care protocol or policy for unconscious patients.

Knowledge of eye care: The researchers developed knowledge of eye care after a thorough examination of the literature. It is composed of 13 multiple-choice questions regarding the anatomy and physiology of the eye, risk factors of eye injury in the ICU, and common complications of the eye in the ICU. Questions were answered "true," "false," and "I don't know." Correct answers were scored as 1, and incorrect or "I don't know" answers were scored as 0. The total score was 13; it was then converted into percentage scores by dividing the respondents' results by the potential maximum scores and multiplying them by 100.

A high score indicates high knowledge. Also, the degree of knowledge was categorized into three categories based on the aggregate scores: low-level knowledge (<60%), moderate-level knowledge (60%–79%), and high-level knowledge (80%–100%; Bloom, 1956).

Eye care practice: The researchers developed eye care practice after a critical and comprehensive review of the literature. The questions were about infection control practices, assessment of the eye, and cleaning the eye. It is comprised of 10 items and rated on five Likert scale items (Never = 1, Rarely = 2, Sometimes = 3, Often = 4, and Always = 5). The practice scores were 50, and they were then converted into percentage scores by dividing the respondents' scores by the potential maximum scores and multiplying them by 100. A high score indicates high practice. Based on the aggregate scores, the degree of practice was classified as poor practice (<60%), fair practice (60%–79%), and good practice (80%–100%; Bloom, 1956).

Validity and Reliability

To test the questionnaire's validity, it was sent to five ophthalmology specialists and ICU nurses. The modifications were

Table 1. Demographic Characteristics of the Participants (N = 152).

Characteristics		M (SD)	N (%)
Age		31.2(7.5)	
Gender	Male		96 (63.2)
	Female		56 (36.8)
Educational level	Diploma		29 (19.1)
	Bachelor		106 (69.7)
	Master		17 (11.2)

Note. M = mean, SD = standard deviation.

implemented in response to the feedback. The Kuder–Richardson coefficient of the knowledge part and Cronbach's alpha of the practice part were .86 and .83, respectively. The Kuder–Richardson coefficient was used for evaluating the internal consistency of the knowledge part because the items in this part were scored correct or incorrect.

Ethical Considerations

Ethical approval was obtained from Arab American University and the Ministry of Health and all participants completed written informed consent. They were instructed that participation is voluntary. No names were mentioned or any personal information about the participant. All data were kept confidential and were used for study purposes only. Participation in the study causes no harm. A clear explanation was given to each participant about the study objectives and tool, and enough time was given for questions.

The Pilot Study

A pilot study was undertaken to evaluate the study tools' clarity and usefulness, as well as to estimate the time required for each tool. It was carried out on 10% of the total individuals who were not part of the current study. The questionnaire took between 10 and 20 min to complete. Some questions were removed because they were irrelevant to the themes; others were added or improved, and required adjustments and modifications were made before the final version was created.

Data Collection

Following approval from the Arab American University and the Ministry of Health, the researcher contacted each nursing

Table 2. Distribution of Participants According to Work-Related Condition (N = 152).

Characteristics		M (SD)	N (%)
Experience in the hospital care	Less 1 year		16 (10.53)
	1–5 years		48 (31.58)
	More than 5 years		88 (57.89)
Experience in ICU	Less 1 year		25 (16.45)
	1–5 years		77 (50.66)
	More than 5 years		50 (32.89)
Do you have any member of your family suffering from eye problem?	Yes		49 (32.2%)
	No		103 (67.8%)
Do you have previous training for eye care course?	Yes		27 (17.8%)
	No		125(82.2%)
Do you have an eye care protocol or policy for unconscious patients?	Yes		47 (30.9%)
	No		105 (69.1%)
How many patients do you take care of per shift?		3.51 (1.5)	
How many ventilated patients do you take care of per shift?		2.1 (1.1)	

Note. M = mean; SD = standard deviation; ICU = intensive care unit.

administrator in the targeted hospitals to present the purpose of the study and obtained a list of ICU nurses. Because Arabic is the native language, to overcome any language difficulties and preserve the validity of the content, the instruments were translated following the translation protocol of the World Health Organization. The instruments were translated into Arabic and back-translated into English. Also, the validity of the instruments was tested, with an Arabic copy of the instruments sent to five bilingual panels of experts in nursing education. The experts had no comments. The questionnaires were distributed face-to-face at each hospital.

Results

One hundred and fifty-two nurses out of 165 nurses (92.1% response rate) participated in this study. The findings revealed that the mean age of nurses was 31.2 (*SD* = 7.5) years. In terms of gender, the majority of the 96 (63.2%) were men. The majority of the participants, 106 (69.7%), have bachelor's degrees, as seen in Table 1.

According to work-related conditions, more than half of the participants—88 (57.89%)—have experience longer than 5 years and 77 (50.66%) have experience between 1 and 5 years in ICU. One-third of the participants, 49 (32.2%), have an eye problem in their family. The majority of the 125 participants (82.2%) had no prior eye care training. The majority of them 105, (69.1%) reported that they do not have an eye care protocol or policy for unconscious patients. The participants reported that 3.51 (*SD* = 1.5) was the average number of patients they took care of per shift, and 2.1 (*SD* = 1.1) were ventilated, as seen in Table 2.

The analysis revealed that 11 (7.2%) of the participants have a fair knowledge level of eye care for patients in the ICU. Also, 28.9% had poor practice and 45.4% had fair practice in eye care for ICU patients, as seen in Table 3.

Multiple regression analysis was utilized to find the factors that are significantly correlated with the practice of eye care. Findings showed that the model explained 25.1% ($R^2 = 0.251$) of the variance in the practice of eye care was explained by the whole model. The results showed that knowledge of patients' eye care in the ICU and an eye care

Table 3. Knowledge and Practice Levels of the Participants (N = 152).

Level	N (%)
Knowledge	
Poor knowledge	140 (92.1)
Fair knowledge	11 (7.2)
Good knowledge	1 (0.7)
Practice level	
Poor practice	44 (28.9)
Fair practice	69 (45.4)
Good practice	39 (25.7)

protocol or policy for unconscious patients were significant predictors of practice ($p < .001$), as seen in Table 4.

Discussion

Nurses perform an essential and distinct function in a healthcare team since they are devoted to working with physicians to preserve patients' lives. The nursing staff in the ICU always focuses on problems that require urgent treatment because they are life-threatening, which may result in a lack of attention to other critical issues such as eye care. Mechanically ventilated individuals are more prone to keratopathy, which can lead to microbial keratitis and corneal perforation as well as vision loss. Furthermore, there are several additional diseases that might have an impact on the health of a mechanically ventilated patient's eyes. Since the nurses' primary focus is to continually check the general condition, ventilation, infections, surgical site infection, catheter-related infections, and so on. The current study discussed the knowledge and practice of eye care for patients in ICUs.

The current study found that 92.1% of the participants had poor knowledge about eye care for ICU patients. This finding was reinforced by Fashafsheh et al. (2013), who found that Palestinian critical care nurses lacked knowledge of eye care. On the other hand, this finding contradicts the findings of Khalil et al. (2019), who reported that nurses' knowledge was enough. The study comprised a convenient sample of 89 nurses working in ICUs at Talkha Central Hospital and Mansoura University Emergency Hospital. Furthermore, this study contradicts the findings of Vyas et al. (2018), who indicated that 93% of nurses were knowledgeable of the increased risk of exposure keratopathy in ventilated patients. According to another survey, 46.7% of ICU nurses had adequate knowledge of eye care, whereas 40% had poor knowledge (Alghamdi et al., 2018).

Also, the current study found that only 25.7% of the participants had good practice in providing eye care to ICU patients. However, 28.9% had poor practice and 45.4% had fair practice in eye care for ICU patients, which indicated that the practice was inadequate. This conclusion is similar to the findings of Khalil et al. (2019), who reported that nurses' practices for eye care of critically ill patients in ICUs were inadequate. Another study, by Fashafsheh et al. (2013), revealed that Palestinian critical care nurses lacked eye care practices.

The current study's findings revealed that nurses' knowledge of patients' eye care in the ICU, as well as an eye care protocol or policy for unconscious patients, were significant predictors of practice. This finding was consistent with the findings of Fashafsheh et al. (2013), who investigated the impact of a designed eye care protocol on nurses' knowledge, practices, and eye health status of unconscious mechanically ventilated patients and found a correlation between critical care nurses' level of knowledge of eye care and their performance score. On the other hand, this result contradicted the

Table 4. Predictors of Practice of Eye Care of Patients Among Nurses in Intensive Care Unit (ICU; N = 152).

Predictor	B	Beta	t	P-value	95% CI Lower	95% CI Upper
Practice						
Knowledge	0.243	.275	3.456	.001	0.104	0.382
Gender	1.823	.057	0.737	.463	−3.070	6.716
Age	−0.040	−.019	−0.197	.844	−0.444	0.364
Educational level	2.370	.083	1.093	.276	−1.918	6.658
Do you have any member of your family suffering from eye problem	3.434	.103	1.375	.171	−1.505	8.374
Number of years of working [nursing]	−3.723	−.162	−1.360	.176	−9.135	1.690
Number of years in ICU	3.637	.160	1.421	.158	−1.423	8.696
Do you have previous training for eye care course?	5.429	.134	1.716	.088	−0.825	11.684
"How many patients do you take care of per shift"?	0.787	.078	0.929	.354	−0.888	2.463
"How many ventilated patients do you take care of per shift"?	−0.560	−.038	−0.447	.655	−3.033	1.914
"Do you have an eye care protocol or policy for unconscious patients"?	−12.689	−.377	−4.718	.000	−18.006	−7.372

$R = 0.501$; $R^2 = 0.251$; adjusted $R^2 = 0.192$.

findings of Khalil et al. (2019), who found no significant association between the overall knowledge score of the investigated nurses concerning eye care and their performances. Other demographic variables were not statistically significant predictors of practice. This finding was consistent with the findings of Alghamdi et al. (2018), which showed no statistical difference between demographic characteristics and nurses' knowledge and practice of eye care for unconscious patients in ICUs.

Implications of Nursing Practice, Education, and Policy

Training nurses based on updated clinical guidelines or protocols for eye care for patients can improve the knowledge, attitude, and practice of ICU nurses. The study suggests conducting training courses for nurses within the context of continuous education in hospitals is crucial to increasing nurses' knowledge of standard practices.

Limitations of the Study

One limitation of the study was the self-reported questionnaire.

Conclusion

The study confirmed that nurses had poor knowledge and inadequate practice of eye care for ICU patients. The study also demonstrated that a nurse's knowledge of patients' eye care in the ICU, as well as an eye care protocol or policy for unconscious patients, were significant predictors of practice. Follow-up interviews are recommended to better understand why nurses' knowledge of eye care is lacking and the barriers to eye care in nursing practice.

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