



**Arab American University**  
**Faculty of Graduate Studies**

**Nurses' Knowledge and Practice of Eye Care for Patients in  
Intensive Care Units in West Bank**

By

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**Ophthalmic Nursing**

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## Approval form





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**DEDICATION**

My study is dedicated to my loving parents, who have always been a source of motivation and inspiration for me, and who have given me the strength and commitment to work with enthusiasm and determination on every task. I dedicate my study to my family members as a mark of their support.

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**Sana Lami**

**ABBREVIATIONS**

<b>Abbreviation</b>	<b>Explanation</b>
AAUP	Arab American University Palestine
ANOVA	Analysis of Variance
SPSS	Statistical Package for Social Sciences
t-test	t student statistical test
KAP	Knowledge, attitude, Practice
ICU	Intensive Care Unit
M	Mean
SD	Standard deviation

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## **Abstract**

### **Nurses' Knowledge and Practice of Eye Care for Patients in Intensive Care Units in West Bank**

#### **Background**

Taking care of patients' eyes is an important nursing skill. Nurses must be capable to provide a standard assessment of the eye and vision as well as provide necessary care. Intensive care unit nurses typically focus on life-threatening issues while giving little attention to corneal injury.

#### **Objective of the study**

The purpose of this study is to assess Nurses knowledge and Practice of Eye care for Patients in Intensive Care Units in West Bank.

#### **Method**

A cross sectional study conducted on all Intensive Care Units nurses from governmental hospitals in West Bank. Data was collected by self-administered questionnaire which was developed by the researcher.

#### **Results**

One hundred and fifty-two nurses participated in this study. The mean age of nurses was 31.2 (SD= 7.5) years. Only 0.7% had good knowledge level, 7.2% had fair knowledge level, and 25.7% had good practice level of eye care for patients in intensive care unit. The knowledge of patients' eye care in intensive care unit and an eye care protocol or policy for unconscious patients were the significant predictors of practice ( $p < 0.001$ ). Also, lack of education among nurses was the main barrier of patients' eye care practice (60.5%).

**Conclusion**

The study confirmed that the nurses had poor knowledge, and inadequate practice of eye care for patients in ICU. The nurse's knowledge of patients' eye care in ICU and an eye care protocol or policy for unconscious patients were the significant predictors of practice. In addition, lack of education among nurses was the main barrier of patients' eye care practice.

**Keywords** Intensive care unit, Nurses, eye care, unconscious patients

**Chapter one**

**Introduction**

## **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 (Gwenhure & Shepherd, 2019). Unfortunately, ICU nurses typically focus on life-threatening issues while giving little attention to other serious issues as corneal injury (Burns & Day, 2012; Güler, Eşer, & Fashafsheh, 2016).

Patients hospitalized to the Intensive Care Unit (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, Sadri, Edgar, & Datta, 2012; Shahin, Dassen, & Halfens, 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 are 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, Hijazi, & Maghrabi, 2015.; Kalhori, et al., 2016; Zhou, Liu, Cui, Zhu, & Lu, 2014)

Ocular surface disease was observed to occur in up to 60% of severe illness patients; 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 abrasion, and corneal ulcers vary from 42 % to 60 %

(Narmawala & Jani, 2017). Previous study revealed that the frequency of eye diseases in ICU patients varied from 3.6% to 89.3%, and the proportion of corneal abrasion in patients on mechanical ventilation varied from 3% to 60%. The occurrence of ocular problems in ICU patients occurred 6.8 days after admission to the ICU on average (Cho, Yoo, Yun, & Hwang, 2017).

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, Lucchini, Bambi, Giusti, & Manici, 2018).

### **1.1 Problem Statement**

When a patient is exposed to a critical condition and admitted to the intensive care unit (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 injury can result in permanent blindness. In the critical care situation, where patients are frequently unable to notify nurses and health care professionals to possible ocular issues, the prevention, identification, and management of such diseases is 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 guideline to follow for eye care in this situation, patients' eyes may be neglected during nursing care (Burns & Day, 2012). To the best of our knowledge, after examining various databases, no research has been conducted on the predictors and obstacles to nurses' practice of eye care conducted in Palestine.

### **1.2 Purpose of the Study**

The purpose of this study is to assess Nurses knowledge and Practice of Eye care for Patients in Intensive Care Units in West Bank.

### **1.3 Significant of the Study**

This study is critical for hospitals, nurses, especially intensive care unit nurses because the findings might aid in the development of successful interventions to increase and improve the quality of nursing care and services while minimizing eye injury.

This study will investigate the influence and result of intensive care unit nurses' knowledge and practice of eye care, which can act an important role in enhancing the quality of care in the future.

This study can reduce risks by intensive care nurses and increase their confidence by understanding their knowledge and the influence of nursing care level on patients.

This study will provide health-care managers with summary of the obstacles to eye care provided by nurses in clinical practice.

The study will assist policymakers in developing informed and evidence-based eye care protocols and policies. The findings of the study will also be useful to other researchers who desire to do similar studies in the future.

#### **1.4 Research Questions**

To achieve the goal of the study, the research questions were:

1. What is the knowledge level of eye care of patients among nurses in ICU?
2. What is the practice level of eye care of patients among nurses in ICU?
3. What are the predictors of practice of eye care of patients among nurses in ICU?
4. What are barriers of patients' eye care practice among nurses in ICU?

#### **1.5 Conceptual Definitions**

**Intensive Care Unit** is “a special area in a hospital where critically ill patients who need close observation and frequent ministrations can be cared for by highly qualified, specially trained staff working under the best possible conditions abbreviated ICU” (Blackwell’s Dictionary of Nursing, 2002).

**Intensive Care Nurse** is “a nurse specialized and trained with knowledge and skills in the field of intensive care nursing and critical thinking, able to provide specialized nursing care to critically ill patients” (Blackwell’s Dictionary of Nursing, 2002)

**Knowledge** is “awareness or familiarity gained by experience; a theoretical or practical understanding of a subject” (The Concise Oxford Dictionary, 1990)

**Practice** is “the usage of rule and knowledge towards action” (Badran, 1995).

#### **1.6 Operational Definitions:**

**Nurse:** A nurse who is formally worked in the care of the sick patients in the intensive care unit.

**Knowledge** is the level of nurses' knowledge of patients eye care which measured by multiple choice questions.

**Practice** refers to the level of nurses' practice of patients eye care in ICU

**Barriers:** Something or a condition that makes it hard or impossible to complete a certain quantity of functioning, for this study, barriers will involve reasons hindering performance of nursing practice towards eye care for patients in ICU.

### **1.7 Theoretical and Conceptual Framework**

The "Knowledge, Attitude and Practice (KAP) model" is a common tool for gathering information from patients and practitioners (Kishore, 2016). Knowledge-Attitude-practice was constructed on the basis of the cognitive, behavioral theory of Schwartz to study the relationship between knowledge, attitudes and practice (Bano et al., 2013). Therefore, the conceptual framework of the current study was built on model of knowledge, attitude, and practice (KAP).

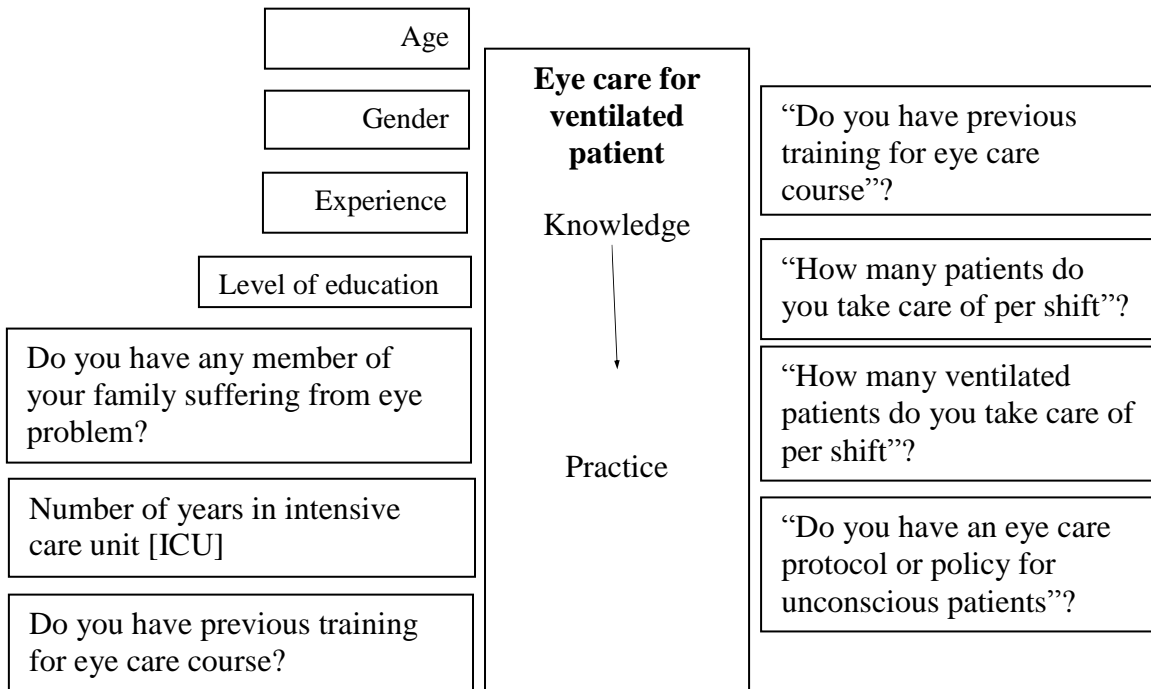


Figure 1-1: Conceptual Framework of "Nurses' Knowledge, and practice towards eye care for ventilated patient

**Chapter two**  
**Literature review**

## Literature Review

### 2.1 Introduction:

This chapter presented the studies about Eye Injuries, Epidemiology of Ocular Complications in Critically Ill Adults, Eye care practice in intensive care unit, and previous studies of knowledge and practice of eye care in ICU patients.

### 2.2 Eye Injuries

Eye injuries in the ICU can differ and harm the systemic and ocular systems of the eye associated with metabolic depletion, invasive and non-invasive mechanical ventilation, multi-organ disorders, decreased levels of consciousness, hypotension, and excessive volumetric filling (Comisso et al., 2018). In a healthy human, the eyelid serves as a mechanical barrier to protect the eyes from injury, organism adherence, and dehydration,

Corneal reflexes are required for the complete dispersion of tears on the ocular surface. A lipid membrane keeps the cornea wet; when the eyelids are closed while sleeping, tears carry leucocytes (Comisso et al., 2018). Corneal and conjunctival epithelial tissues improve tear retention in the eye. Their constant evaporation enables the conjunctiva to maintain an adequate temperature, preventing bacterial growth. Corneal reflexology provides protection from physical threats, but fast eye movement is required during sleep to ensure the dispersion of watery humor behind closed eyelids (Comisso et al., 2018).

### **2.3 Epidemiology of Ocular Complications in Critically ill patients**

Eye complications may affect many parts of the eye, including the cornea, conjunctiva, and sclera. Micro corneal perforation, which is commonly linked with dry eye syndrome, corneal abrasion, erosion, ulceration, infection, or scarring are all possible pathologies (Johnson & Rolls, 2014). Acute corneal inflammation, described as any alteration on the surface of the eye, has been identified to be indicative of corneal epithelial infection in the ICU population (keratitis). This infection might be bacterial or fungal in nature (Johnson & Rolls, 2014). Corneal inflammation has been discovered to be a key cause in the development of ocular surface disorders when it extends throughout the entire cornea. It may also result in significant problems such as vision loss, corneal disruption, and the necessity for corneal transplants (Johnson & Rolls, 2014).

The incidence of eye problems was shown to be strongly related to ICU duration of stay, concomitant illness, and gastrointestinal or respiratory concerns. These problems were also shown to be closely associated to the patient's level of consciousness, artificial airway use, tracheostomy, positive end-expiratory pressure, the presence of bronchial secretion, and history of sedative and muscle relaxant use (Comisso et al., 2018). The probability of developing eye problems was shown to be 2.8 times higher in patients with an ICU stay of more than seven days, seven times higher in patients with depression, and 10.8 times higher in coma patients (Comisso et al., 2018).

Lastly, the neural tunic, also known as the retina, is the innermost layer of the eye, consisting of a thin outer layer called the pigment and a thicker inner layer called the nerve. Light traveling across the nerve is absorbed by the pigmentation of the retina. This inhibits light from going through the nerve, resulting in visual echoes. Light receptors and supporting cells are found in the retina's nerve terminals, which are responsible for preliminary processing and integrating visual information (Peate, 2016).

## **2.4 Indications for eye care (Dougherty and Lister, 2015); Shaw, 2014)**

- “To clean the eye of discharge and crusts”
- “After eye surgery to prevent complications”
- “Prior to eye drop installation”
- “To soothe eye irritation, pain and discomfort”
- “To prevent corneal damage/abrasion in unconscious/sedated patients”

## **2.5 The underpinning principles of Eye Cleansing**

- The eye should be carefully evaluated before eye care is offered.
- Patients should be reassured to carry out their own eye care if they are assessed and found able to do so
- Each eye should be treated as a separate procedure and a separate dressing pack should be used for each eye to prevent cross contamination
- “Infected eyes should be treated last to reduce the risk of cross infection” (Dougherty & Lister, 2015)
- “A clean technique can be used for eye cleansing unless there are specific concerns about infection risk such as in post-operative patients – in which case an aseptic procedure should be used” (Dougherty & Lister, 2015)
- “Low-lint or lint-free swabs should be used to cleanse eyes as lint fibers can scratch the cornea. Cotton wool should be avoided as the cotton wool threads can catch on the eyelashes”
- Dougherty and Lister (2015) recommend “sterile water for eye cleansing and suggest sterile sodium chloride 0.9% may cause stinging and irritation”.

However, other authors suggest using sodium chloride 0.9% (Shaw, 2014; Ring & Okoro, 2016)

- “A light source should be positioned behind the nurse so it illuminates the eye, but it should not shine directly into the eye as this will be uncomfortable for the patient”

## **2.6 Eye Care Practice in Intensive Care Unit**

Eye cleaning regimens using sterile water or normal saline every two to four hours have been used in certain eye care practices. It might be done once or twice a day by applying a liquid to the top of the eye. Moisturizing treatments, such as methylcellulose eye drops, have also been shown to be beneficial in preventing dry eyes. Ocular ointments have also been used on high-risk patients or when there is signs of eye injury (Johnson & Rolls, 2014).

Comisso et al. (2018) suggested the following approaches for preventing eye problems: assessing individual patients to identify risk factors for ophthalmological complications and conducting daily assessments of patients' abilities to keep their eyelids closed. Maintaining eyelid closure by mechanical means may be necessary for individuals who are unable to close their eyelids and are sedated or unconscious. The regimen would have to be repeated every two hours (Comisso et al., 2018). Similarly, Marshall, Elliott, Rolls, Schacht, and Boyle (2008) recommended that all patients who could not close their eyelids or who were unconscious or highly sedated should get eye care on a regular basis every two hours.

The study also underlined the need of professional nurses cleaning patients' eyes with saline-soaked gauze and giving eye-specific lubricants. Incomplete eyelid closure

was graded into three categories: grade 0—completely closed eyes; grade 1—open eyes with sclera or conjunctiva visible; and grade 2—open eyes with cornea visible. Grade 0 recommended no action, grade 1 needed lubrication, and grade 2 required lubrication and taping of the lids with tape at the lash edge (Johnson & Rolls, 2014).

## **2.7 Nurses' Knowledge and Practice Regarding Patients' Eye Care In ICU**

In a descriptive study to verify the aspects and practices of nurses on eye care in Turkey and Palestine intensive care units, it was revealed that normal saline (75.9%) was the most frequently reported solution for eye hygiene among Palestinian nurses, and gauze immersed in normal saline or sterile water (64.3 %) was the most commonly used supplies by Turkish nurses. Even though both Palestinian and Turkish ICU nurses made efforts to avoid eye problems in critical patients, there were certain gaps and inadequacies in ICU patient eye care. There is a need for ongoing education in this field (Güler, Eşer, & Fashafsheh, 2016).

A literature review was also conducted in order to identify the evidence available in delivering the best eye care to prevent exposure keratopathy. PUBMED, COCHRAN, and EMBASE library databases were searched. The most effective of the numerous eye care measures advised to avoid exposure keratopathy is the use of polyethylene covers. Early detection and treatment will aid in the prevention of microbial keratitis and vision loss (Alansari, Hijazi, & Maghrabi, 2015)

Puspasari (2019) conducted a cross-sectional study to examine the factors that impact nurses in the implementation of eye care towards coma patients in intensive care units. According to the findings, half of the nurses (50.96 percent) had a good

background, but were unfavorable on normative certainty and belief components. The background circumstances resulted in a favorable nurse with a score of 50.96 percent.

In terms of Nurse Knowledge and Perception of Eye Care Practice, Alghamdi, Ghaleb, and Abdel Aal. (2018) conducted a descriptive cross-sectional study to identify intensive care nurses' knowledge about eye care for unconscious and mechanically ventilated patients and to assess nurses' perception of eye care practice for unconscious and mechanically ventilated patients. According to the study's findings, 46.7 % of intensive care unit (ICU) nurses have adequate knowledge, whereas 40 % had inadequate knowledge. The overall nurses' perception of eye care practice was 95.6 % positive, with a 98.2 median, a 5.6 IQR, and no significant differences was noticed between medical and surgical ICU nurses in total and subtotal score of perception.

Similarly, Milutinović, Cvijanović, Ćirić, Jovanović, & Andrijević (2017) conducted a prospective, observational, cross-sectional study to assess nurses' knowledge, attitudes, and everyday clinical practice regarding eye care in mechanically ventilated critically sick patients. The findings indicate that additional improvement in the quality of eye care in mechanically ventilated patients is required based on the average score of knowledge, attitude, and everyday practice test. There is a significant positive association between attitudes and practices in eye care; more positive attitudes lead to higher quality practices.

A descriptive study using a purposive sample was recently conducted to survey 30 nurses in two teaching hospitals in southern Iraq to assess nurses' knowledge of evidence-based practice toward eye care in intensive care units, as well as to investigate relationships between their demographics and total knowledge. The study's findings

indicated that the overall mean of nurses' knowledge was poor (0.33) (Jaafr, Al-Jubouri, & Alfatlawee, 2020).

In contrast, Vyas, Mahobia, & Bawankure (2018) conducted a cross-sectional study to show the degree of knowledge and practice patterns related exposure keratopathy in mechanically ventilated patients among Chhattisgarh state Intensive Care Unit (ICU) nurses. The findings indicated that 93 % of nurses were knowledgeable of the increased risk of exposure keratopathy in ventilated patients. Only 5% of the nurses adhered to a stringent routine for eye care, whereas 43% checked for eyelid closure in ventilated patients and 48% cleaned the eyes regularly. Those who were aware of exposure keratopathy examined eyelid closure more frequently (73 % vs. 48 %) and cleansed their eyes with saline gauze.

Also, Khalil, Abd Elhameed, Abdel-kader, and Atia (2019) conducted a cross-sectional study to examine nurses' knowledge and practices regarding eye care of critically sick patients in intensive care units (ICUs). The study used a convenient sample of 89 nurses from the Intensive Care Units at Talkha Central Hospital and the Emergency Hospital Mansoura. The study's findings indicated that the majority of ICU nurses evaluated had adequate knowledge but inadequate practice in areas such as hand washing before administering eye care, detecting indications of infection, and monitoring the pupil reflex and eye movement. The study found no significant relationship between total nurses knowledge and their practice regarding eye care ( $r = 0.034$ , P Value 0.751).

A descriptive research was also conducted to investigate nurses' knowledge, attitudes, and behaviors regarding the care of unconscious adult patients in teaching hospitals in

Al-Hilla City. The study's findings indicated that nurses' knowledge of caring for unconscious adult patients was adequate (Abbas & Mohammed, 2019).

### **Summary**

The literature review in this chapter focused on elements that must be considered in a research that intends to assess nurses' knowledge and practice of eye care for patients in Intensive Care Units in the West Bank. The research design and methods will be detailed in the next chapter methodology.

The literature focused more on the knowledge and performance of eye care in intensive care unit by nurses, basing on their prior knowledge and experience. Most of the studies on have been done outside Palestine. According to the conclusions of these studies, some of them found that nurses' knowledge of eye care in the ICU was adequate, while others found it to be inadequate. More research on the predictors and barriers to patients' eye care practice among ICU nurses is required. Furthermore, no studies on predictors or barriers were been out in Palestine. The studies highlighted the necessity for a research on nurses who work in ICU.

## **Chapter Three**

### **Methodology**

## **Methodology**

### **Introduction**

This chapter describes the research methods employed in the study, including the research design, questionnaire design phases, population for the pilot study, sampling frame, data collection and analysis plan. Research methods must address the research questions and subsequently lead to the achievement of the research objectives.

### **3.1 Study Design**

The study design was quantitative, cross sectional study. Data was collected by utilizing a self-administered questionnaire. Using this design to achieve the purpose of the study which is to assess Nurses knowledge and Practice of Eye care for Patients in Intensive Care Units in West Bank.

### **3.2 Study Population and Sample**

The targeted participants of the study were all nurses working in ICUs in the hospitals in West Bank (Governmental sector).

#### **3.2.1 The Inclusion Criteria Will Include Who are:**

1. Nurses who approved to participate in the study.
2. Nurses who provide direct care to patients.

#### **3.2.2 The Exclusion Criteria Will Include Who are:**

1. Nurses who didn't work in ICU

### **3.3 Study Instrument**

The questionnaire was consisting of the following parts:

1. Demographic data and work conditions: developed by the researchers for research purpose. It includes age, gender, Educational level, do you have any member of your family suffering from eye problem, Number of years of working [nursing], Number of years in intensive care unit [ICU], do you have previous training for 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
2. Knowledge of eye: The researchers developed their knowledge of the eye after undertaking a thorough examination of the literature. It is composed of 13 multiple-choice questions regarding eye care. The knowledge scores were converted into percentage scores by dividing the respondents' results by the potential maximum scores and multiplying by 100. The total score of each result was calculated using Bloom's cutoff point (Blooms, 1956). The degree of knowledge was categorized into three categories based on the aggregate scores: low level knowledge (less than 60%), moderate level knowledge (60-79%), and high level knowledge (80-100%).
3. Eye care practice: The researchers developed eye care practice after conducting a comprehensive review of the literature. It is comprised of five Likert scale items (Never=1, Rarely =2, Sometimes=3, Often=4, and Always=5). The practice scores were converted into percentage scores by dividing the respondents' scores by the potential maximum scores and multiplying by 100. The total score of each result was calculated using Bloom's cutoff point (Blooms, 1956). Based on the aggregate scores, the degree of practice was classified as Poor Practice (less than 60%), Fair Practice (60-79%), and Good Practice (80-100%).

4. Barriers of eye care practice: developed by the researchers and it was open ended questions.

### **3.4 Validity and Reliability**

The content validity of the questionnaire was assessed by an expert panel of five anonymous ophthalmology specialists' background and ICU nurses who have been working in the Palestinian health sector for a long period of time. Prior to the study, for the assessment of the reliability of the questionnaire, a random sample of 15 nurses was recruited to complete the questionnaire and the obtained Cronbach's alpha value was 0.83 for practice subscale.

### **3.5 Ethical Considerations**

Ethical approval was obtained from Arab American University and Palestinian Ministry of Health. Consent form was provided for every participant prior to the study. Voluntary participation was explained to nurses. No names were mentioned or any personal information about the participant. All data was being kept confidential and was used for study purposes only. No any harms of consequences due to participation refusal such as care quality or privileges. Clear explanation was given to each participant about the study objectives and tool, enough time was given for questions.

### **3.6 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 a random sample of 15 nurses working in ICU who were excluded from the actual study. The questionnaire

took between 10 and 20 minutes 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.

**Table 3-1 Modification of the Questionnaire**

	Item		
1.	Type of ICU	Removed	
2.	I do eye health assessment routinely two times in nursing shift	Modified	I do eye health assessment routinely at the beginning of the new nursing shift
3.	I wear gown when suction the patient	Modified	I use personal protective equipment
4.	I maintain Eyelid closure for unconscious patients.	Modified	I maintain Eyelid closure who are unable to independently maintain complete lid closure.
5	I make documentation of eye health and interventions	Added	

### 3.7 Data Collection

After obtaining approval from the Arab American University Palestine and Palestinian Ministry of health (MOH), the researcher contacted each nursing administrator in the targeted hospitals to present the purpose of the study and took the list of ICU nurses in the hospitals. The questionnaires were distributed face by face contact at each hospital. Participants assigned the informed consent which was on the first page of the questionnaire. Participation was optional, and there were no individual responses available to administrators or those responsible for evaluating nursing performance. Data was maintained confidential by the use of a password-protected site. No individuals had access to the data except the researcher

Until beginning data collection, ethical permission was obtained from the Arab American University of Palestine. Participation by nurses was voluntary, and confidentiality was maintained. Nurses have also been told their response will be protected. Forms of consent and questionnaire were delivered to nurses who expressed interest to participate in the study. Consent encompassed details about the purpose of the study, a concise description and instructions, and clarification that there are no harms or risks in participation.

In addition, nurses were informed they could withdraw from the study and whether they wish to leave there would be no penalty or loss of benefits.

### **3.8 Data Analysis**

Data was carried out through categorized, organized, tabulated and statistically analyzed using SPSS software statistical computer package version 23. Data was analyzed as frequency, percentage, mean and standard deviation. Also, linear regression was used to assess the predictors of nurses' practice. The threshold of significance was fixed at the  $p < 0.05$ , 0.01 level for interpretation of results of tests of significance.

## **Chapter four**

### **Results**

## **Results**

### **Introduction**

This chapter deals with the data collected for analysis. The statistical method allowed the investigator to deduce, analyze, coordinate, measure, evaluate and convey the numerical information. The aim of data analysis is to provide answers to questions about the study. The data analysis strategy comes directly from the question, the design and the data collection process and the level of measurement of the data. This chapter edits, tabulates, analyzes and interprets the data collected.

This chapter expresses the findings concerning to assess Nurses knowledge and Practice of Eye care for Patients in Intensive Care Units in West Bank. Statistical analyses were directed to explore three research questions:

1. What is the knowledge level of eye care of patients among nurses in ICU?
2. What is the practice level of eye care of patients among nurses in ICU?
3. What are the predictors of practice of eye care of patients among nurses in ICU?
4. What are barriers of patients' eye care practice among nurses in ICU?

### **4.1 Reliability of the Study Scale**

Cronbach's Alpha was calculated for the practice subscale of the nurses regarding eye care and it was 0.80.

### **4-2 Response Rate**

The nurses in the current study composed of all nurses working in the intensive care units of the governmental hospitals in West Bank/ Palestine. One hundred and fifty-two

out of 165 questionnaires (92.1% response rate) were completed and returned by the nurses.

From an organizational point of view, the response rate obtained for this research was very good; as such the findings should include more reflective details about the nursing population.

### 4.3 Participants' Characteristics

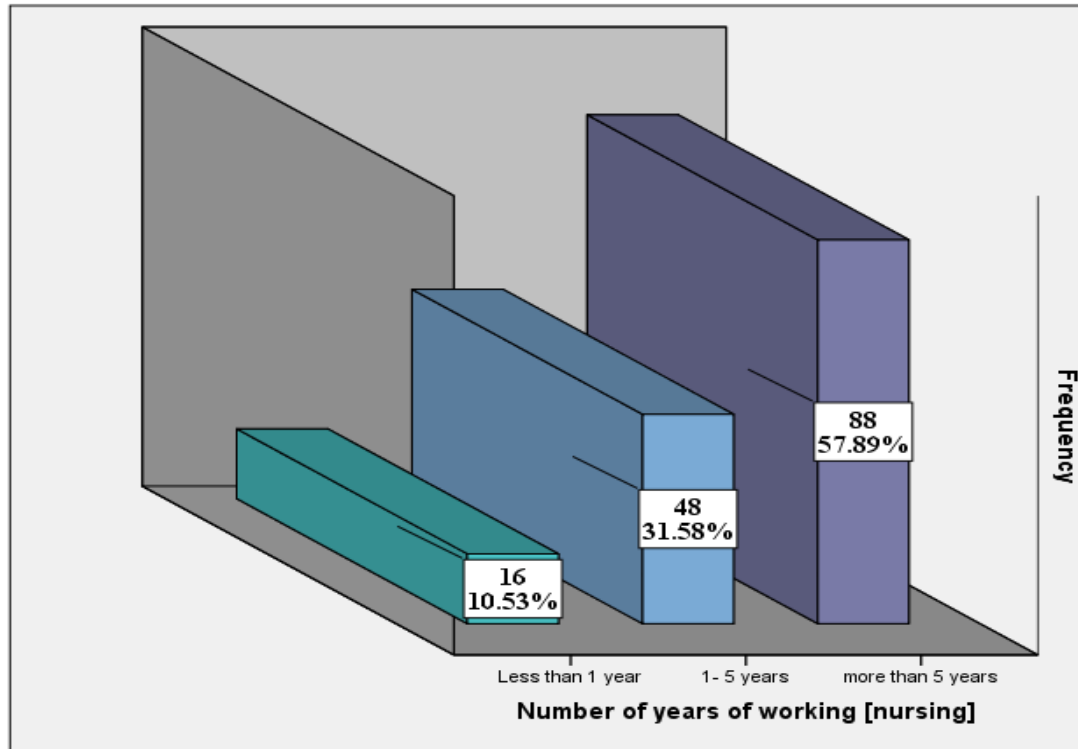
One hundred and fifty-two nurses participated in this study. The findings revealed that the mean age of nurses was 31.2 (SD= 7.5) years. With regard to gender, the majority 96(63.2%) were males. The majority of the participants 106 (69.7%) have bachelor degree, as seen in table (4-1).

**Table 4-1: 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%)

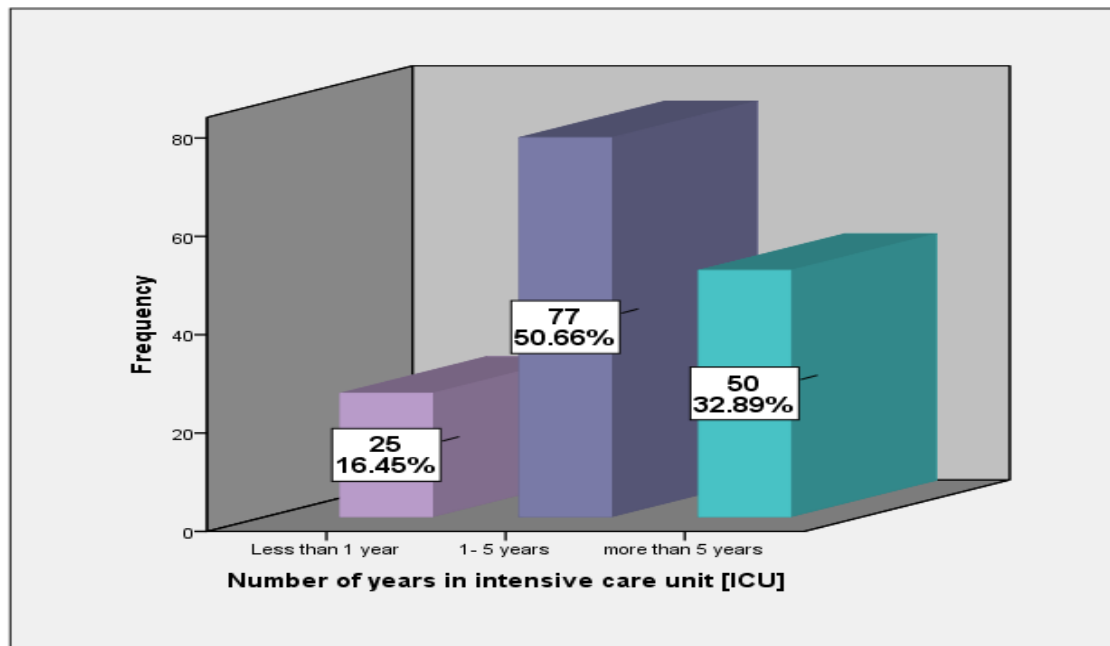
*M= Mean, SD= standard deviation*

Also, more than half of the participants 88 (57.89%) have an experience more than 5 years working in hospitals, as seen in figure (4-1).



**Figure 4-1: Distribution of the participants according to experience in hospitals (N=152)**

In addition, approximately half of the participants 77 (50.66%) have an experience 1- 5 years working in ICU, as seen in figure (4-2).



**Figure 4-2: Distribution of the participants according to experience in ICU (N=152)**

Moreover, 49(32.2%) of the participants reported that they have a member of their family suffering from eye problem. Most of the participants 125 (82.2%) haven't previous training for eye care course and 05(69.1%) reported that they haven't an eye care protocol or policy for unconscious patients. The participants reported that 3.51(SD=1.5) the average of patients who take care of per shift and 2.1(SD=1.1) were ventilated, as seen in table 4-2.

**Table 4-2 Distribution of Participants According to Work Related Condition**

(N=152)

Characteristics		M (SD)	N (%)
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)	

*M= Mean, SD= standard deviation*

#### 4.4 Testing Research Questions

##### **Research question 1: What is the Knowledge Level of Eye Care of Patients Among Nurses In ICU?**

The study indicated that only 1(0.7%) and 11(7.2%) of the participants were at good knowledge level and fair knowledge level of eye care for patients in ICU respectively, as seen in table (4-3).

**Table 4-3: Knowledge Level of The Participants (N=152)**

<b>knowledge level</b>	<b>N (%)</b>
Poor knowledge	140(92.1%)
Fair knowledge	11(7.2%)
Good knowledge	1(0.7%)

**Research question 2: What is the Practice Level of Eye Care of Patients Among Nurses in ICU?**

The study indicated that only approximately one quarter of the participants 39 (25.7%) have good practice of eye care for patients in ICU, as seen in table (4-4).

**Table 4-4: Practice Level of the Participants (N=152)**

<b>Practice level</b>	<b>N (%)</b>
Poor Practice	44(28.9%)
Fair Practice	69(45.4%)
Good Practice	39(25.7%)

As reported in Table 4-5, it was found that the most always/frequently practice patient eye care nursing care items were: item (7) “I clean patient eye to remove debris, secretions, dried ointment and/or other ocular medications’ (55.3%), item (8) “I clean of the eye with saline soaked gauze for patient with, or at risk of lagophthalmos” (47.4 %), and item (9) “I take care to ensure that patient eyes are not exposed to aspirates during tracheal or oropharyngeal suction procedures” (45.3%).

Regarding practice patient eye care nursing care items that were not frequently practices, item (5) 30.9% of the participants reported that they rarely/never they take bilateral swabs for culture where red eyes are identified. This was followed by item (10)

they make documentation of eye health and interventions (23.0%), and item (3) they do eye health assessment routinely at the beginning of the new nursing shift (21.7%).

Also, one important issue was one fifth of the participants never/rarely wash their hands before and after eye care or health assessment for eye. This issue needs more concern among nurses to prevent transmission of infection among patients.

**Table 4-5: Nurses Perceived Practice of Eye Care (N=152)**

	Item	Rarely/ Never	Sometimes	Often/ Always
1	I wash my hands before and after eye care or health assessment for eye	29(19.1%)	27(17.8%)	96(43.1%)
2	I do eye health assessment on admission.	32(21.1%)	53(34.9%)	67(44.0%)
3	“I do eye health assessment routinely at the beginning of the new nursing shift”	33(21.7%)	56(36.8%)	63(41.5%)
4	I use of personal protective equipment	31(20.4%)	54(35.5%)	67(44.1%)
5	I take bilateral swabs for culture where red eyes are identified	47(30.9%)	66(43.4%)	39(25.7%)
6	“I maintain Eyelid closure who are unable to independently maintain complete lid closure”.	32(21.1%)	59(38.8%)	61(40.1%)
7	“I clean patient eye to remove debris, secretions, dried ointment and/or other ocular medications”.	15(9.9%)	53(34.9%)	84(55.3%)
8	I clean of the eye with saline soaked gauze for patient with, or at risk of lagophthalmos	26(17.1%)	54(35.5%)	72(47.4%)
9	“I take care to ensure that patient eyes are not exposed to aspirates during tracheal or oropharyngeal suction procedures”.	32(21.1%)	51(33.6%)	69(45.3%)
10	I make documentation of eye health and interventions	35(23.0%)	58(38.2%)	59(38.8%)

### **Research Question 3: What are the Predictors of Practice of Eye Care of Patients Among Nurses in ICU?**

The third research question was to determine the predictors of practice of eye care of patients among nurses in ICU. All assumptions were met for linear regression.

A multiple regression analysis showed a significant model which means factors could correlate to practice of eye care ( $F= 4.26$ ,  $p < 0.001$ ), including knowledge of patients’ eye care in ICU ( $B= 0.243$ ,  $p= 0.001$ ) and an eye care protocol or policy for

unconscious patients ( $B= 12.689$ ,  $p= 0.001$ ). These factors were the only significant predictors for practice of eye care of patients among nurses in ICU (Table 4-6).

**Table 4-6: Predictors of Practice of Eye Care of Patients Among Nurses in ICU (N=152)**

Model	t-test	P-value
<b>Practice</b>		
Knowledge	3.456	.001*
Gender	.737	.463
Age	-.197	.844
Educational level	1.093	.276
Do you have any member of your family suffering from eye problem	1.375	.171
Number of years of working [nursing]	-1.360	.176
Number of years in intensive care unit [ICU]	1.421	.158
Do you have previous training for eye care course?	1.716	.088
“How many patients do you take care of per shift”?	.929	.354
“How many ventilated patients do you take care of per shift”?	-.447	.655
“Do you have an eye care protocol or policy for unconscious patients”?	-4.718	.001*

*Significance at  $P<0.05$*

#### **Research Question 4: What are the Barriers of Patients’ Eye Care Practice**

##### **Among Nurses in ICU?**

The study indicated that majority of the participants 92(60.5%) reported that lack of education among nurses was the main barrier of patients’ eye care practice. However, 19 (12.5%) of them reported lack of staffing was the main barrier of patients’ eye care practice, as seen in table (4-7).

**Table 4-7: Barriers of Patients' Eye Care Practice Among Nurses in ICU (N=152)**

<b>Barriers</b>	<b>N (%)</b>
"Lack of education"	92(60.5)
"Unclear escalation process when there were concerns about a patient's eyes"	21(13.8)
"Eye care perceived as being low priority when patients are acutely unwell"	20(13.2)
"Lack of staffing"	19(12.5)
Total	152(100.0)

## **Chapter five**

### **Discussion, Recommendations, and Conclusion**

## **Discussion, Recommendations, and Conclusion**

### **Introduction**

In this chapter, discussion, conclusions, and recommendations will be explained. The conclusion will be formulated according to the purpose of the study. The purpose of this study was to assess Nurses knowledge and Practice of Eye care for Patients in Intensive Care Units in West Bank.

### **5.1 Discussion**

Nurses perform 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 Intensive Care Unit (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. The current study discussed knowledge and Practice of Eye care for Patients in Intensive Care Units.

#### **5.1.1. Knowledge**

The knowledge of nurses working in critical care units on eye care obtained by nurses in ophthalmic care is dependent on their education, job experience, and ongoing training that they get during their tenure (Moradi, 2016).

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, Morsy,

Ismaeel, and Alkaiasi (2013), who found that Palestinian critical care nurses lacked knowledge on 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 Intensive Care Units at Talkha Central Hospital and Emergency Hospital Mansoura University. 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 intensive care unit (ICU) nurses had adequate knowledge of eye care, whereas 40 % have poor knowledge (Alghamdi, Ghaleb & Abdel Aal, 2018). This may be due to availability of eye protocol or policy in ICU, continuous education for the nurses, and availability of ophthalmic nurse in ICU. These factors may increase knowledge of eye care among nurses.

### **5.1.2. Practice**

The current study found that 25.7 % had good practice and 45.4 percent have fair practice in eye care for ICU patients. This conclusion is similar with the findings of Khalil et al. (2019), who reported that nurses' practices for eye care of critically ill patients in intensive care units (ICUs) were inadequate. Another study, by Fashafsheh et al. (2013), revealed that Palestinian critical care nurses lacked eye care practices.

### **5.1.3. Predictors of Practice of Eye Care of Patients In ICU**

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 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.

#### **5.1.4. Barriers of Patients' Eye Care Practice Among Nurses in ICU**

The majority of participants 60.5 % indicated that the biggest obstacle to patients' eye care practice was a lack of education among nurses.

In this regard, Dawson (2005) asserts that, while emphasizing the supply of information on surface eye illnesses and clinical symptoms of eye care in ICU, raising such knowledge will improve nurses' motivation in paying attention to eye complications and eye care. In Liem's (2019) study, 75% of participants cited a lack of training as a barrier to eye care in the ICU. These studies support the current study's findings on the favorable influence of training on nurses' knowledge and attitude, as well as future practice improvement. These studies are consistent with the results of the present study and confirm the effectiveness of training to increase knowledge that lead to improve correct practice.

## **5.2 Recommendations**

Based on the finding of the present study, the following recommendations were made:

1. Routine eye care should be provided to severely sick patients in the ICU.
2. Update and provide further education for nurses on ICU eye care.
3. Eye care should be one of the nursing license renewal courses
4. Infection control program for nurses
5. Frequent assessments of eye health status and care by nurses should be maintained and documented in nursing documentation.
6. Additional qualitative research into eye care in critical care units as a foundation for continuous advances in everyday nursing practices.

### **5.3 Conclusion**

The study found that 92.1 % of participants had poor knowledge, 25.7 % had good practice, and 45.4 % had fair 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. Furthermore, the study confirmed that the majority of participants (60.5 %) stated that the main barrier to patients' eye care practice was a lack of education among nurses.

**References**

**Appendix**

**Arabic summery**

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## Appendix A

### Nurses' Knowledge and Practice of Eye Care for Patients in Intensive Care Units Questionnaire

My name is Sana' Lami, I'm a postgraduate student at Arab American University-  
Ramallah

I invite you to participate in this research study. The study is carried out as a part of fulfilling the requirement for a master degree in Health Ophthalmic of Nursing.

This study aim to assess the level of Nurses' knowledge and Practice of Eye care for Patients in Intensive Care Units in West Bank. Therefore, this semi self-administered questionnaire for nurses who are working in the adult intensive care units to assess and evaluate their knowledge, and practice about eye care for intubated pt.

Your effective participation has it is own importance for eye care for ventilated pt.

This research study may help in finding possible solution and recommendations to increase the nurses' knowledge and skills.

This questionnaire needs less than 30 min. Names are not required. Your participation in this study is voluntary and you are free to withdraw your participation at any time. The information in this study will only be used for research purposes.

Participant privacy and confidentiality will be completely protected, no identifiers or personal information will be collected or stored including participants name ID, and others, kindly append your signature below.

Declaration:

I accept that I have read and understood the above explanation and I'm willing to participate in this study voluntarily

Participant's signature .....

Thank you for your cooperation

**Part One: Demographic data:**

1- Gender     Male \_\_\_\_\_                      Female. \_\_\_\_\_

2- Age .....

3- Educational level     Diploma \_\_\_\_\_     Bachelor \_\_\_\_\_     Master  
\_\_\_\_\_

4. Do you have any member of your family suffering from eye problem?

Yes \_\_\_\_\_                      No \_\_\_\_\_

**Work related data**

1- Number of years of working [nursing] .....

2- Number of years in intensive care unit [ICU] .....

3- Do you have previous training for eye care course?    Yes \_\_\_\_\_                      No  
\_\_\_\_\_

4- How many patients do you take care of per shift? .....

5- How many ventilated patients do you take care of per shift? .....

6. Do you have an eye care protocol or policy for unconscious patients?

Yes \_\_\_\_\_                      No \_\_\_\_\_

**Part Two: Knowledge of eye**

**1. Does the visual organ include?**

- A. Eye sockets, eyelashes and conjunctiva, lacrimal, eyeball
- B. Visual Pathways
- C. Ears
- D. a, b is correct
- E. a, b, c is correct

- 2. Which of the following statements is incorrect about eye conjunctiva?**
- A. Bulbar conjunctiva: covering the front of the eyeball except the cornea.
  - B. Palpebral conjunctiva: this portion covers the inner surface of both the upper and lower eyelids
  - C. Forniceal conjunctiva is the transition place of the two types of conjunctiva.
  - D. Controls the size of pupil regulating the light that reaches the retina
- 3. Which part of the eye blinks constantly keeping the surface of the eye lubricated and removing dirt?**
- A. Eyelash
  - B. Eyebrow
  - C. Eyelid
  - D. Conjunctiva
- 4. What are functions of tears?**
- A. Reducing friction
  - B. Preventing infection and dirt
  - C. Supplying oxygen and nutrients to the eyes
  - D. a, b is correct
  - E. a, b, c is correct
- 5. How many milliliters of tear create from tear gland per day?**
- A. 1 mL
  - B. 2 mL
  - C. 3 mL
  - D. 4 mL
- 6. Which of the following statements is incorrect?**
- A. The function of the eyelid and conjunctiva is to cover and protect the front part of the eyeball by a blinking or reflexive eye movement.
  - B. Eyelid creates wetness and evenly spread tear film on the cornea, preventing too strong light.
  - C. The upper eyelid is less mobile than the lower eyelid; when closed, it completely covers the cornea.
  - D. Blinking eyelids constantly keep the surface of the eye lubricated and remove dirt.

**7. How many layers of eyeball?**

- A. Sclera
- B. Choroid
- C. Retina
- D. a, b is correct
- E. a, b, c is correct

**8. Which of the following statements is correct about the sclera?**

- A. It is a thin, transparent membrane, containing lymphatic organization and auxiliary tear glands.
- B. The shell is very tough, about 1 mm thick, white, with little blood vessels, accounting for 4/5 after, connected with the cornea in front, is composed of unevenly arranged collagen fibers, responsible for protecting protect the eyeball.
- C. It is a transparent sphere, no vascular and rich in nerves, accounting for 1/5 before, 0.5 to 1 mm thick, horizontal diameter about 12 mm.
- D. There is a spherical shape, the front diameter of about 23 mm, volume of about 6.5 ml, and the inside contains transparent environments: aqueous humor, vitreous chamber and lens. e. It is a transparent, bi-convex lens, without blood vessels, behind the iris and in front of the lens. Horizontal diameter is about 9 mm, about 4 mm thick.

**9. Which of the following statements is correct about the cornea?**

- A. It is a thin, transparent membrane, containing lymphatic organization and auxiliary tear glands.
- B. The shell is very tough, about 1 mm thick, white, with little blood vessels, accounting for 4/5 after, connected with the cornea in front, is composed of unevenly arranged collagen fibers, responsible for protecting protect the eyeball.
- C. It is a transparent sphere, no vascular and rich in nerves, accounting for 1/5 before, 0.5 to 1 mm thick, horizontal diameter about 12 mm.
- D. There is a spherical shape, the front diameter of about 23 mm, volume of about 6.5 ml, and the inside contains transparent environments: aqueous humor, vitreous chamber and lens.

**10. Which of the following statements is correct about the lens?**

- A. It is a thin, transparent membrane, containing lymphatic organization and auxiliary tear glands.
- B. The shell is very tough, about 1 mm thick, white, with little blood vessels, accounting for 4/5 after, connected with the cornea in front, is composed of unevenly arranged collagen fibers, responsible for protecting protect the eyeball.
- C. It is a transparent sphere, no vascular and rich in nerves, accounting for 1/5 before, 0.5 to 1 mm thick, horizontal diameter about 12 mm.
- D. There is a spherical shape, the front diameter of about 23 mm, volume of about 6.5 ml, and the inside contains transparent environments: aqueous humor, vitreous chamber and lens.
- E. It is a transparent, bi-convex lens, without blood vessels, behind the iris and in front of the lens. Horizontal diameter is about 9 mm, about 4 mm thick.

**11. The basic mechanism causing dryness, abrasion, eye corneal infections related to?**

- A. Eyelid closing
- B. Interruption of reflexes flashing eyelids
- C. Eyelid flashing frequency
- D. a, b is correct
- E. a, b, c is correct

**12. In ICU, is the main cause of eyelid reflex disorder?**

- A. Due to the care of nursing
- B. Due to sedative effects
- C. Due to coma
- D. b, c is correct
- E. a, b, c is correct

**13. Common eye complications in the ICU?**

- A. Chemosis
- B. Corneal abrasion/exposure keratopathy
- C. Conjunctivitis
- D. Bacterial keratopathy
- E. a, b, c, d is correct

### Part Three: Eye care practice

		Never	Rarely	Sometimes	Often	Always
1	“I wash my hands before and after eye care or health assessment for eye”					
2	“I do eye health assessment on admission”.					
3	“I do eye health assessment routinely at the beginning of the new nursing shift”					
4	“I use of personal protective equipment”					
5	“I take bilateral swabs for culture where red eyes are identified”					
6	“I maintain Eyelid closure who are unable to independently maintain complete lid closure”.					
7	“I clean patient eye to remove debris, secretions, dried ointment and/or other ocular medications”.					
8	“I clean of the eye with saline soaked gauze for patient with, or at risk of lagophthalmos”					
9	“I take care to ensure that patient eyes are not exposed to aspirates during tracheal or oropharyngeal suction procedures.”					
10	“I make documentation of eye health and interventions”					

### Part four: Barriers of eye care practice

**Please mention the barriers of eye care practice for critically ill patients in the intensive care unit?**

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## المخلص

تعتبر العناية بعيون المرضى مهارة تمريضية مهمة. يجب أن يكون الممرضون قادرين على تقديم تقييم معياري للعين والرؤية بالإضافة إلى توفير الرعاية اللازمة مثل تنظيف العين. عادة ما تركز ممرضات وحدة العناية المركزة على القضايا التي تهدد الحياة مع إيلاء القليل من الاهتمام للقضايا الخطيرة الأخرى.

### الهدف من الدراسة

الغرض من هذه الدراسة هو تقييم معرفة التمريض وممارساتهم لرعاية العيون المرضى في وحدات العناية المركزة في الضفة الغربية.

### طريقة الدراسة

دراسة مقطعية أجريت مع جميع ممرضات وحدات العناية المركزة من المستشفيات الحكومية في الضفة الغربية. تم جمع البيانات عن طريق استبيان ذاتي تم تطويره من قبل الباحث.

### نتائج الدراسة

شارك مائة واثان وخمسون ممرض وممرضة في هذه الدراسة. أظهرت النتائج أن متوسط عمر المشاركين كان 31.2 (SD = 7.5) سنة. أظهر التحليل أن 0.7% فقط لديهم مستوى معرفة جيد ، 7.2% لديهم مستوى معرفة مقبول، و 25.7% لديهم مستوى ممارسة جيد للعناية بالعيون للمرضى في وحدة العناية المركزة. وأظهرت النتائج أن معرفة العناية بالعيون للمرضى في وحدة العناية المركزة وبروتوكول أو سياسة رعاية العيون للمرضى فاقد الوعي كانت تنبئاً مهماً بالممارسة ( $p < 0.001$ ) كما أفاد 60.5% أن نقص التعليم بين الممرضات كان العائق الرئيسي لممارسة العناية بالعيون لدى المرضى.

### الاستنتاج

أكدت الدراسة أن الممرضات لديهم معرفة ضعيفة ، وممارسة غير كافية للعناية بالعيون للمرضى في وحدة العناية المركزة. كما أكدت الدراسة أن معرفة الممرضة برعاية عيون المرضى في وحدة العناية المركزة وبروتوكول أو سياسة رعاية العيون للمرضى فاقد الوعي كانت من العوامل الهامة التي تنبئ بالممارسة. بالإضافة إلى ذلك ، أكدت الدراسة أن نقص التعليم بين الممرضات كان العائق الرئيسي لممارسة رعاية عيون المرضى.

**الكلمات المفتاحية** وحدة العناية المركزة ، الممرضات ، العناية بالعيون ، مرضى فاقد الوعي