Knowledge on Eye Health Care Among Intensive Care Unit Nurses in a Tertiary Hospital, Nepal

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In ICU-admitted patients, around 60.0 % had developed ocular surface disease. In back old days, treating patients of the ICU with their life-threatening medical condition was of only concern; so, nurses of the ICU paid little attention to other comorbidities of the eyes that could occur. Knowledge of nurses regarding eye health and complications that could occur due to ICU stay and their prevention is essential. This was a descriptive cross-sectional study conducted among 108 ICU Nurses of Bir Hospital. Non-probability purposive sampling technique was adopted in the study to collect data. A well-written informed consent sheet was obtained before the data collection. Data were collected through a self-administered questionnaire and entered into MS Excel. The data sheet was exported to SPSS for further analysis. All the ICU nurses were female. The study found that 24.2% of study participants had correct knowledge regarding common eye complications during ICU stay. Only 16.4% had correct knowledge regarding the secretion of tears from the tear gland per day. While 69.9 % had correct knowledge regarding blinking of the eyelid and its function to lubricate and clean

the eye. Knowledge regarding eye health care among ICU nurses seems not to be satisfactory. There is an urgent need for proper training regarding eye health care to ICU nurses so as to prevent keratopathy, conjunctivitis, corneal ulcer, and corneal abrasion, and other eye-related morbidity during ICU stay.

Keywords: eye health care, intensive care unit, keratopathy.

Individual who have been admitted to the Intensive Care Unit (ICU) generally are in an unconscious state and require mechanical ventilation, and they are prone to different comorbidities not related to their medical condition, like sepsis, hospital-acquired pneumonia, bed sores, and exposure keratopathy.[1–3] In the past, treating patients of the ICU with their life-threatening medical condition was of only concern; so nurses of the ICU paid little attention to other comorbidities that could occur during their hospital stay.[4] In ICU-admitted patients, around 60.0 % had developed ocular surface disease due to incomplete eyelid closure.[5] Eye complications like conjunctivitis, corneal ulcer, and corneal abrasion were found in 42.0% to 60.0% of ICU-admitted patients.[6] These complications are often linked to insufficient knowledge and awareness among ICU nurses, particularly for patients whose ICU stay exceeds seven days.[7,8] Adequate knowledge and proactive management by ICU nurses can prevent ocular complications, thereby safeguarding patients' vision and improving their quality of life after ICU discharge. Assessing the knowledge of ICU nurses regarding eye health care is therefore essential to identify gaps in practice and guide hospital administrators and policymakers in implementing targeted interventions to enhance patient safety and care quality.[7,9]

Materials & Methods

This is a descriptive cross-sectional study conducted among ICU Nurses of Bir Hospital. The study period was from April 2024 to July 2025. The estimated sample size was 108, calculated using Cochrane's formula, with a 95% confidence interval, and based on the previous prevalence (0.624) of adequate knowledge on eye care among ICU nurses in Amhara Region, Ethiopia.[10]

$$n_0 = \frac{Z^2 pq}{e^2}$$

Non-probability purposive sampling technique was adopted in the study. Those ICU nurses who had been working for more than 6 months in the ICU were enrolled. A well-written informed consent sheet was obtained before the data collection. IRC approval letter from the National Academy of Health Sciences was obtained (Ref No:

1378\2081\2082). The data collection tool was a self-administered questionnaire, developed by reviewing relevant literature and previously validated studies on eye care practices among nurses. The data sheet was exported to SPSS 16 for further analysis.

Results

Descriptive Characteristics

In this study, all participants were female. Participants whose age was below 25 years were 38.89%. Most of the participants were Janajati (43.52%), followed by Brahmin/Chhetri 27.78% and Dalit (12.96%). Among them 15.74% had worked for more than 6 months in ICU similarly, 9.26% had worked for more than 1 years, 38.89% had worked for more than 2 years, 24.07% had worked for more than 3 years and 12.04% had worked for more than four years, most of them had completed bachelor (43.52%) followed by PCL (37.96%) and Masters (18.52%).

Table 1: Socio-demographic Characteristics (n = 108)

Characteristics	**n**	**%**
Gender		
Male	0	0
Female	108	100
Age		
≤ 25	42	38.89
≥ 25	66	61.11
Ethnicity		
Brahmin/Chhetri	30	27.78
Janajati	47	43.52
Dalit	14	12.96
Other	17	15.74
Years in ICU Nursing		
≥ 6 months	17	15.74
1	10	9.26
2	42	38.89
3	26	24.07
≥5	13	12.04
Academic Qualification		
PCL	41	37.96
Bachelor	47	43.52
Masters	20	18.52

Knowledge Related to Eye Health

In this study, it was found that 54.63% had correct knowledge that the conjunctiva doesn't have any role in controlling light to reach the retina. Similarly, 69.44% had correct knowledge about eyelid blinks, constantly keeping the surface of the eye lubricated, and removing dirt. Only 16.67% had correct knowledge regarding the function of tears. Most of them, 61.11% had correct knowledge about the upper eyelid, and 65.74% had knowledge about the Layers of the eyeball. Only 28.70% of respondents had correct knowledge of the thickness of the sclera along with its composition. Similarly, 81.48% of

participants had knowledge of the causes of eyelid reflex disorder. Only 24.07% had knowledge of common eye complications in ICU patients, as shown in **Table 2**.

Table 2: Knowledge of Respondents on Eye Health (n = 108)

SN	Questions	Correct n (%)	Incorrect n (%)
1	**Which of the following statements is incorrect about the 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 conjunctivae. d. Controls the size of the pupil, regulating the light that reaches the retina. e. The conjunctiva is the clear, thin membrane that covers part of the front surface of the eye and the inner surface of the eyelids.	59 (54.63)	49 (45.37)
2	**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 e. a, b, c, d correct	75 (69.44)	33 (30.56)
3	**What are the 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	18 (16.67)	90 (83.33)

4	**How many milliliters of tears are created from the tear glands per day?** a. 1 mL b. 2 mL c. 3 mL d. 4 mL e. 5 mL	18 (16.67)	90 (83.33)
5	**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 with a blinking or reflexive eye movement. b. The eyelid creates wetness and evenly spreads 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. e. Eyelids act as a mechanical barrier to protect the eyes from injury, dehydration, and adhesion of microorganisms.	66 (61.11)	42 (38.89)
6	**How many layers of eyeball?** a. Sclera b. Choroid c. Retina d. a, b is correct e. a, b, c is correct	71 (65.74)	37 (34.26)
7	**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 few blood vessels, accounting for 4/5 after, connected with the	31 (28.70)	77 (71.30)

	cornea in front, and is composed of unevenly arranged collagen fibers, responsible for protecting the eyeball. c. It is a transparent sphere, non-vascular and rich in nerves, accounting for 1/5 before, 0.5 to 1 mm thick, horizontal diameter about 12 mm. d. d. There is a spherical shape, the front diameter of about 23 mm, a 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, and about 4 mm thick.		
8	**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 few blood vessels, accounting for 4/5 after, connected with the cornea in front, and is composed of unevenly arranged collagen fibers, responsible for protecting the eyeball. c. It is a transparent sphere, non-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, and about 4 mm thick.	20 (18.52)	88 (81.48)
9	**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 few blood vessels, accounting for 4/5 after, connected with the	19 (17.59)	89 (82.41)

	cornea in front is composed of unevenly arranged collagen fibers, responsible for protecting the eyeball. c. It is a transparent sphere, non-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, and about 4 mm thick.		
10	**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	58 (53.70)	50 (46.30)
11	**In ICU, what 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	88 (81.48)	20 (18.52)
12	**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	26 (24.07)	82 (75.93)

Discussion

In this study, all participants were female (100.00%), with the majority above 25 years of age (61.11%), most belonging to the Janajati ethnic group (43.52%), and nearly 39.00% having two years of ICU nursing experience (38.89%). The predominant academic qualification was a

bachelor's degree (43.52%). Regarding knowledge of eye health care, more than half of the nurses correctly understood the role of the conjunctiva (54.63%) and the eyelid through blinking (69.44%), while knowledge of tear function (16.67%) and daily tear secretion (16.67%) was notably low. Moderate knowledge was observed for upper eyelid mobility (61.11%) and eyeball layers (65.74%), but fewer participants were aware of the thickness and composition of the sclera (28.70%), cornea dimensions (18.52%), and lens thickness and diameter (17.59%). Only about a quarter of participants (24.07%) correctly identified potential eye complications due to ICU stay, highlighting significant gaps in knowledge that underscore the need for targeted educational interventions.

A study conducted in Chhattisgarh state, India, revealed that the mean working months as ICU nurses were 22.9±17.8 months. However, knowledge on the development of keratopathy due to the longer duration of ICU ventilated patients was found to be 93.0%. It reported that 43.0% of ICU nurses checked for eyelid closure in ventilated patients, and 48.0% of those nurses cleaned the eyes from time to time. Nurses of the cardiac ICU were less aware in comparison to medical ICU nurses.[11] A study conducted in West Bank hospitals revealed that the mean age of nurses was 31.2±7.5 years. Similarly, it also identified 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.[12] A study conducted in Saudi Arab observed a slightly higher proportion of ICU nurses (46.7%) had good knowledge of eye health care.[13] A study conducted in Turkey revealed that the average age of ICU nurses was 32.48 ±7.45 years, and showed that female nurses had comparatively better knowledge than male nurses. Similarly, nurses working in the Neonatal ICU had a higher level of eye health care knowledge in comparison to others. Nurses who had received in-service training on eye health care also had a higher level of knowledge.[14] In contrast to our findings, a study conducted in Iran reported a very poor knowledge score (mean: 0.33). The majority of nurses (63.3%) had not received any training in eye health care.[15]

Similar to the findings of the present study, a study conducted in Turkey and Palestine identified that there was a significant gap in knowledge regarding eye health care among ICU nurses in both nations.[16] Similar to our findings, a study conducted in Iran found that ICU nurses highlighted inadequate education and training as a critical barrier to providing proper eye care.[17] Another study from Iran revealed that ICU working nurses' knowledge in eye health was 43.3±14.86 in moderate levels,

while attitude and practice were good (84.56±11.61 and 73.11±17.17, respectively). Nurses' work experience positively correlated with their eye care knowledge and attitude.[18] A study conducted in Egypt revealed a higher proportion of (74.0%) ICU nurses had an unsatisfactory level of knowledge regarding eye care, while about 92 % of the ICU nurses had a negative attitude regarding eye care, and about 6.0 % of the ICU nurses had a satisfactory level of practice regarding eye care.[19]

On the other hand, more recent interventional studies emphasize the impact of structured training. A 2025 quasi-experimental study demonstrated that video-based educational programs significantly improved ICU nurses' awareness and practices regarding prevention of exposure keratopathy (EK) among mechanically ventilated and unconscious patients ($p<0.001$), underscoring the potential benefit of targeted education for bridging knowledge and practice gaps.[20] Another trial implementing an eye care protocol among ICU staff showed a marked reduction of ocular complications among critically ill patients, suggesting that improved nurse knowledge, combined with standardized protocols, can translate into better patient outcomes.[9,21]

Conclusion

The overall knowledge regarding eye health care among ICU nurses seem not to be satisfactory. There is urgent need for proper training regarding eye health care for ICU nurses so as to prevent eye-related morbidity during ICU stay.

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