



The Impact of an Educational Program on ICU Nurses' Eye Care Knowledge and Practices

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Abstract

Introduction: The majority of ICU patients require holistic care, neglecting which can lead to various issues, including eye-related problems. This research aimed to assess the impact of a designed educational program focusing on eye care for patients on the knowledge and practice of ICU nurses in selected hospitals affiliated with Iran University of Medical Sciences.

Methods: A semi-experimental study investigated the impact of a designed educational program on the knowledge and performance of 126 nurses working in the ICU departments in Tehran during the year 1402. The intervention consisted of three 2-hour educational sessions. The control group received standard hospital training. Data analysis utilized descriptive and analytical statistics, chi-square, independent t-tests, and paired t-tests with SPSS version 19 software. To adhere to research ethics, educational booklets were also provided to the nurses in the control group after the sessions.

Results: Initially, there were no statistically significant demographic differences between the groups. Pre-intervention, both control and intervention groups exhibited similar average scores in knowledge and practice. However, following the training sessions, the intervention group's scores notably improved, leading to a statistically significant difference between the two groups (knowledge $P=0.000$ and practice $P=0.02$).

Conclusions: Training on eye care proves effective in enhancing nurses' knowledge and skills. It appears essential to incorporate workshops and ongoing training sessions for sustained improvement and optimal outcomes. In this way, it is possible to prevent eye problems in patients hospitalized in ICUs, and if they occur, timely care can achieve favorable results.

INTRODUCTION

Most patients admitted to the intensive care unit (ICU) require thorough and comprehensive care due to their altered consciousness [1]. Neglecting holistic care for all bodily systems and organs can lead to various issues unrelated to their primary condition, including pressure ulcers, pneumonia, and ocular problems [2]. Among ICU patients, microbial keratitis, chemosis, eye infections, corneal damage and dry eye syndrome are prevalent eye disorders [3, 4].

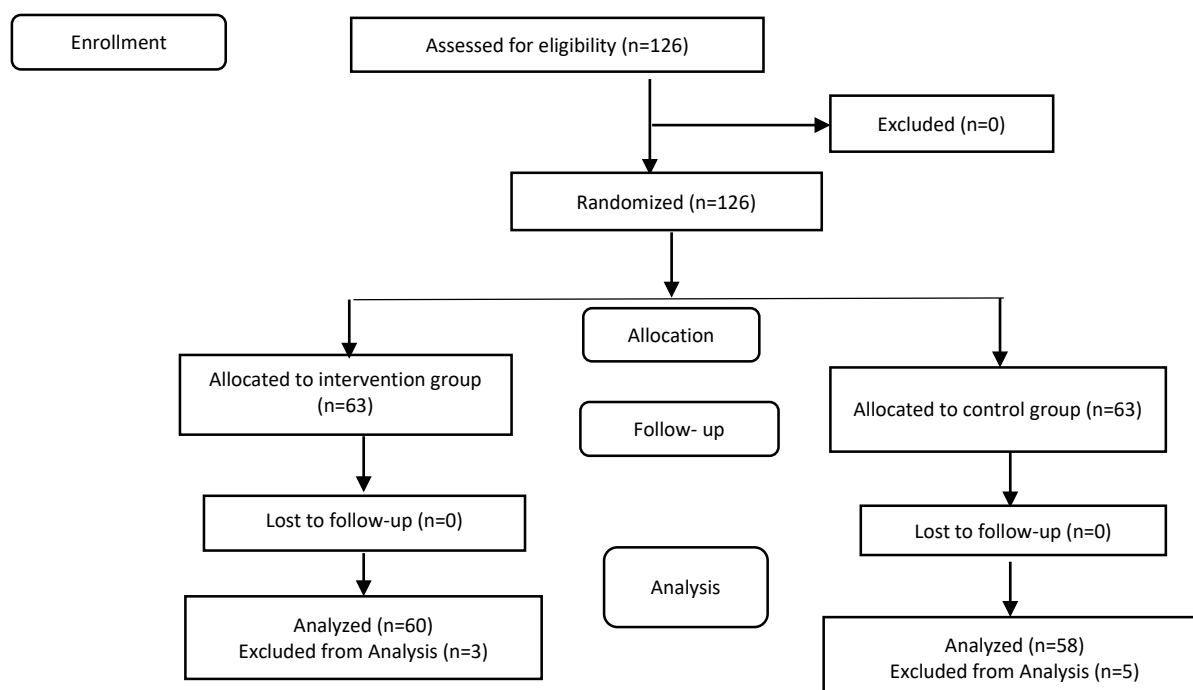
The ocular surface is a sophisticated and intricately regulated system that provides anatomical, physiological, and protective functions for the eye [5]. Normally, the eye surface is safeguarded by tear production, the blink reflex, and eyelid closure [1, 6]. However, factors such as nerve-blocking drugs, sedatives, and muscle relaxants can disrupt these protective mechanisms in patients hospitalized in the Intensive Care Unit (ICU), leading to incomplete eye

closure, reduced tear production, and diminished blinking reflex [7]. Delayed diagnosis of these eye-related disorders, coupled with inadequate nursing care, can significantly impact patient outcomes [8].

Numerous studies have highlighted the prevalence of eye problems among ICU patients, ranging from 33.3% to 89.3%. This high prevalence underscores the often-neglected aspect of eye care within specialized wards [4, 7, 9-11].

Despite the critical role of eye care in nursing practice, it is frequently overshadowed by the management of life-threatening situations and the functioning of vital organs like the heart and lungs [4]. Nurses' awareness of eye problems and their proficiency in timely diagnosis and treatment are pivotal for patient recovery [12]. However, several studies have revealed a low level of knowledge and performance among nurses concerning eye-related factors and preventive strategies [3, 13, 14]. Despite numerous global studies in this field, there remains limited information regarding the prevalence of eye disorders and the corresponding care provided to ICU patients in Iran [13]. The scarcity of research in this area within Iran, coupled with the high incidence of eye disorders, highlights a significant educational gap. Remarkably, based on the researcher's firsthand experience, no specialized care protocols or standardized eye evaluation methods are consistently employed in ICU departments. Furthermore, eye complications are often inadequately documented in

Consort Flow Diagram



The study employed block random allocation for sampling. With two intervention and control groups, fixed blocks were calculated using Random Allocation

nursing reports, lacking an organized and systematic approach.

Given the substantial impact of eye disorders on both patients and the healthcare system, their prediction, prevention, diagnosis, and treatment are crucial for healthcare professionals. Proper education is essential to address this gap [6]. Consequently, this study aimed to assess the impact of a designed educational program on the knowledge and clinical practices related to eye care among nurses working in ICU departments.

METHODS

This semi-experimental study investigated the impact of a designed educational program on the knowledge and performance of nurses working in the ICU departments of Firouzgar and Hazrat Rasool Akram hospitals in Tehran during the year 1402, according to the Iranian calendar.

Ethical approval was obtained from the Ethics Committee of Iran University of Medical Sciences, with the ethics code IR.IUMS.REC.1402.086. To determine the minimum required sample size at a 95% confidence level, 80% test power, and 3.5% accuracy, the formula yielded a sample size of 57 nurses in each group. Considering potential dropouts, an estimated 63 nurses were included in each group.

Software, resulting in 10 nurses per block and a total of 13 blocks. Nurses were assigned to the intervention or control groups based on their order of placement within

the blocks. The assignment process was conducted after randomly selecting a block number, ensuring researcher independence. First, a number between 1 and 13 (corresponding to the block) was randomly chosen, followed by allocation to the intervention or control group based on the software division.

Inclusion criteria for nurses were willingness to participate in the research, a minimum of 6 months of ICU work experience, and at least a bachelor's degree in nursing. Exclusion criteria included non-participation in at least one session and failure to complete the instrument.

After obtaining written consent from the center's officials, the researcher visited the ICU departments. She introduced herself and explained the research purpose to the nurses working in the ICU. Eligible nurses were then identified for participation. After obtaining written consent forms, the eligible nurses were randomly assigned to either the control or intervention group using a random numbers table. The intervention consisted of three educational sessions.

First Session: In this session, the purpose of the research and the intervention method were clearly explained. Nurses received a questionnaire, and after completing it, the researcher discussed the importance of eye care, eye anatomy, causes of eye complications in ICU patients, and protective mechanisms for the eyes.

Second Session: The focus was on the most common eye complications in patients, including investigation, diagnosis, and treatment strategies.

Third Session: Nurses learned about eye examination principles, eye care protocols, and proper use of eye medications. Each session lasted 2 hours.

The control group received routine hospital training. Two weeks later, both groups completed the questionnaires again. Data analysis utilized descriptive

and analytical statistics, chi-square, independent t-tests, and paired t-tests using SPSS version 19 software (confidence level: $P < 0.05$). To adhere to research ethics, an educational booklet was also provided to the nurses in the control group after the sessions.

RESULTS

In this study, a total of 118 nurses were selected from the special care departments of Firouzgar and Hazrat Rasool Akram hospitals in Tehran. The study spanned from Ordibehesht to Shahrivar 1402 (Iranian calendar). The participation rate was 95.2% in the intervention group and 92% in the control group. After excluding 3 individuals from the intervention group and 5 from the control group who did not complete the second-round questionnaires, the study revealed that most participants were female and had undergraduate education. Their age ranged from 24 to 54 years, with an average age of 34.33 ± 6.95 in the control group and 33.27 ± 5.84 in the test group ($P = 0.64$). The minimum work experience was one year, with a maximum of 16 years and an average of 5.1 ± 4.68 in the control group and 6.41 ± 3.52 in the control group ($p = 0.548$). Other demographic characteristics are presented in Table 1, with no significant statistical difference between the groups in terms of demographics.

The study found that before the intervention, there was no significant difference in the average scores of knowledge and clinical performance between the control and intervention groups (Table 2). However, after the training sessions, the average scores increased significantly in the intervention group, resulting in a statistically significant difference between the two groups (Table 3).

Table 1. ICU Nurse Demographics for Study Participants (N = 118)

	Control Group, No. (%)	Intervention Group, No. (%)	p-value
Gender			0.917
Male	9 (15.5)	8 (13.4)	
Female	49 (84.4)	52 (86.6)	
Education			0.198
Bachelor's	52 (89.6)	48 (80)	
Master's	6 (10.4)	12 (20)	
Infection control training			0.451
Yes	46 (79.3)	40 (66.6)	
No	12 (20.3)	20 (33.4)	
Eye care training			0.919
Yes	26 (44.8)	26 (43.3)	
No	32 (55.2)	34 (56.7)	

Table 2. Comparison of average knowledge and clinical performance of the two groups before the intervention

	Knowledge, Mean $\pm$ SD	Practice, Mean $\pm$ SD
Intervention group	7.64 $\pm$ 3.68	65.44 $\pm$ 8.26
Control group	7.10 $\pm$ 2.89	70.58 $\pm$ 14.22
TEST	F=3.78	F=2.31
	P= 0.09	P= 0.13

Table 3. Comparison of average knowledge and clinical performance of the two groups after the intervention

	Knowledge, Mean $\pm$ SD	Practice, Mean $\pm$ SD
Intervention group	12.56 $\pm$ 3.17	74.61 $\pm$ 10.10
Control group	7.91 $\pm$ 3.09	70.26 $\pm$ 13.06
TEST	F=31.12	F=5.48
	P=0.000	P= 0.02

DISCUSSION

Insufficient knowledge and suboptimal performance by nurses in delivering eye care to patients in ICU departments can lead to adverse outcomes, including microbial keratitis, chalazion (chymosis), eye infections, corneal damage, and dry eye syndrome. This study investigated the impact of an educational program specifically targeting patient eye care. The focus was on nurses working in the ICU departments of selected hospitals affiliated with Iran University of Medical Sciences.

The present study found no significant correlation between the average knowledge and clinical practice of eye care in nurses working in the ICU department and demographic variables. A review of existing literature reveals that despite the critical importance of eye care for patients in ICUs, there are still deficiencies in preventing and treating these issues. For instance, a study by Jaffar and colleagues (2020) found that eye care was not a top priority for nurses in Iraq, and variables such as age, sex, work experience in ICU, and education level did not impact the quality of care provided. This highlights the need for further education and training in eye care for nurses working in ICU departments [15].

The findings of this study highlight a low level of knowledge among nurses regarding eye care, emphasizing the ongoing necessity for training courses aligned with established standards for nurses in ICU departments [15]. In a separate study in Turkey and Palestine, it was observed that despite Palestinian nurses using normal saline and Turkish nurses using gas-soaked solutions for eye care, there was a recognized need for educational interventions to enhance knowledge and improve nursing practices [4]. Additionally, a study by Vyas and colleagues in 2018 in India, focusing on the knowledge and practices of nurses in ICU departments, revealed that while nurses were well-informed about eye strain, their performance in providing eye care exhibited deficiencies, with none of the nurses documenting any eye complications [2]. These studies collectively underscore the importance of continuous education and skill development for nurses to optimize eye care practices in ICU settings.

The present study revealed that eye care training significantly improved the knowledge and performance of nurses in specialized departments. This finding aligns with a semi-experimental study conducted by Tork et al. (2022) which demonstrated a 64% improvement in the knowledge and implementation of the eye care protocol

by nurses following a 6-session intervention, resulting in a majority of the intervention group not experiencing any eye surface disorders [16]. In a similar vein, another study found that training clinical guidelines for eye care of ICU patients significantly improved the knowledge, attitude, and performance of nurses in eye care for ICU patients [11]. The researchers emphasized the importance of continuous training and supervision of eye care by nursing managers for patients admitted to the ICU. A clinical trial study compared conventional eye care methods with interventional methods in corneal health in special care units. The results showed that all three interventional methods were more effective than the conventional eye washing method alone with normal saline [17]. McCall et al. (2016) implemented an interdisciplinary team approach to provide training on eye care, resulting in a significant reduction in children's eye complications. The researchers emphasized the importance of inter-team cooperation and continuous training to improve the knowledge and performance of healthcare workers in preventing eye disorders and defects [18]. Finally, a semi-experimental study conducted by Elkasby et al. (2021) in Egypt found that a 6-session training program significantly improved nurses' performance in eye care for patients under ventilators. The training included theoretical and practical components, using videos, simulations, and problem-solving situations to enhance learning [19].

CONCLUSION

The provision of eye protection for patients in specialized care units is an essential aspect of nursing care, and preventing eye injuries is a fundamental responsibility of nurses in these units. The results of this study indicate that eye care training significantly enhances nurses' knowledge and performance, suggesting that continuous training workshops and classes are necessary for sustainability and achieving better results. One limitation of the study is that the training session was provided for the entire intervention group simultaneously, which was challenging due to the different shifts of the nurses. To address this, the researchers communicated with the educational supervisor to facilitate participation in the class by explaining the research objectives. Another limitation is the potential influence of the mental condition of the researched units on the way the questionnaire was completed, which was beyond the control of the researcher. Nonetheless, the study's findings highlight the importance of ongoing education and training for

nurses in specialized care units to ensure optimal eye care and injury prevention.

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ETHICAL CONSIDERATIONS

Ethical approval for this study was obtained from the Ethics Committee of Iran University of Medical Sciences under code IR.IUMS.REC.1402.086.

AUTHORS' CONTRIBUTIONS

Conceptualization: HGH. Data curation: FGH, SM. Formal analysis: SHH. Funding acquisition: Iran University of Medical Sciences. Methodology: SM. Project administration: HGH. Writing-original draft: FGH, HGH. Writing-review and editing: HGH.

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CONFLICTS OF INTEREST

There are no conflicts of interest. Acknowledgments

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