

## Original Article

# Knowledge, attitude, and expertise of nurses in intensive care unit regarding oral and dental care in hospitalized patients.

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## ABSTRACT

**Background:** The purpose of this study was conducted to evaluate the knowledge, attitude, and practice of intensive care unit (ICU) nurses about oral and dental care in hospitalized patients.

**Materials and Methods:** In this descriptive-analytic study, the statistical population included 214 nurses working in the ICU of the affiliated hospitals of Isfahan University in 1394. The level of knowledge, attitude, and practice of ICU nurses was assessed using questionnaires whose justifiability and stability were verified at the beginning of the study with a pilot study. Data were entered into SPSS software and tested by t-test, Spearman, one-way variance, and least significant difference test. The significance level was  $< 0.05$ .

**Results:** The data of this study showed that the score of knowledge and performance in male nurses was significantly different from female nurses. There was a significant relationship between nurse's education and their knowledge score ( $P < 0.001$ ). Furthermore, the performance score of nurses working in different parts was different too ( $P < 0.001$ ).

**Conclusion:** The findings showed that the knowledge and performance of female nurses about oral care were higher than men, but the attitude of the two sexes is almost the same. Nurses with lower educational degree had less knowledge, but their attitude and performance did not differ. The performance score of nurses working in ICU was different, but they had similar knowledge and attitudes.

**Key Words:** Intensive care unit, nurse, oral care

Received: 14-Apr-2020  
Revised: 23-Apr-2021  
Accepted: 22-May-2021  
Published: 21-Oct-2021

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## INTRODUCTION

Oral hygiene is essential in intensive care unit (ICU) patients, because ICU not only increases the risk of oral dysfunction but also increases the risk of developing hospital pneumonia in patients with poor oral hygiene.<sup>[1,2]</sup> In this regard, nurses working in the ICU have a special responsibility, and maintaining oral hygiene and preventing oral disorders in ICU

patients is in their area of duties.<sup>[3,4]</sup> Patients admitted to the ICU suffer from poor oral health due to decreased consciousness and dysfunctional swallow. In addition, the use of ventilator in most patients leads to accumulation of discharge, dental plaque, and colonization of Gram-negative bacteria in the posterior part of the pharynx and larynx, which, if

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**How to cite this article:** Haghigat A, Mohammadi I, Tahani B, Teimoori F. Knowledge, attitude, and practice of nurses in intensive care unit regarding oral and dental care in hospitalized patients. Dent Res J 2021;18:83.

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infiltrated into the lungs, leads to hospital pneumonia. This infection accounts for one-third of all hospital infections in the ICU.<sup>[2,5]</sup> Moreover, studies have shown that there is a strong correlation between bacterial colonization in oropharynx and pneumonia dependent on mechanical ventilation.<sup>[6-8]</sup> Furthermore, oral cavity is the main source of upper respiratory tract infections in ICU patients, therefore, oral care should be a priority in the health-care team as a factor in the quality of life of patients.<sup>[9-11]</sup>

Oral care is an important part of preventive measures in the development of hospital pneumonia and can reduce its incidence by an average of 45%.<sup>[12]</sup> Considering the above, one of the important issues that play an important role in providing oral care is nurses' beliefs, attitudes, and practice about providing care and preventing possible complications.<sup>[13-15]</sup> Therefore, considering that the knowledge, attitude, and practice of nurses in the field of oral health play an important role in providing the health of the individual and the community, and due to the lack of adequate studies about oral care in ICU, this study was conducted to evaluate the knowledge, attitude, and practice of nurses regarding oral health care in ICU patients.

## MATERIALS AND METHODS

The present *in vitro* study was approved by the Research Ethics Committee of Isfahan University of Medical Sciences, Isfahan, Iran (with the ethics code of 395152). This descriptive-analytical study was done on 214 nurses working in ICU of Isfahan University of Medical Science's hospitals in 1394. The inclusion criteria included nurses working in the ICU, nurse consent for cooperation to complete the questionnaire, and having at least a A.S nursing degree. The exclusion criteria included nurses who did not complete the questionnaires completely and did not respond to more than 20% of the questions. After reviewing and studying the literature and research, including the study by Rello *et al.*<sup>[2]</sup> as well as Ranjbar *et al.*,<sup>[16]</sup> a preliminary questionnaire was designed. Justifiability and stability are based on the methods presented in the articles for the correctness of the measure of variables and the similarity of the results over time and the same conditions with the similar method of work, which were examined with the ability of repeatability and reproducibility.<sup>[17-20]</sup> The questionnaires were reviewed by some faculty

members of the Department of Oral and Maxillofacial Surgery of Isfahan University of Medical Sciences and some faculty members of the Department of Internal Surgery (Faculty of Nursing, Isfahan University of Medical Sciences) and its justifiability was confirmed. The questionnaires were submitted to twenty ICU nurses and then were collected after completion. After 2 weeks, the questionnaires were distributed again among the mentioned nurses. After completing the questionnaires, they were re-collected. Data were analyzed with SPSS software by calculating the intraclass correlation coefficient for knowledge, attitude, and practice and confirmed with 0.80, 0.84, and 0.86 (stability score), respectively. The questionnaire has also been reviewed and approved by the Medical Education Development Board.

Sample size: According to the following formula

$$n = \frac{Nz^2\sigma^2}{d^2(N-1) + z^2\sigma^2}$$

$$Z = 1.96 \quad d = k\sigma \quad N = 600 \quad k = 0.1$$

With 214 participants, we are 95% sure that our error in calculating the mean score of knowledge, attitude, and practice will not be more than 0.1  $\sigma$ .

The total number of questions in the questionnaire was 34: questions 1–5 related to demographic characteristics, questions 6–16 related to the knowledge section, 17–26 questions related to the attitude section, and questions 27–34 related to the expertise part. In the knowledge section, one score was considered for each question, resulting in a maximum score of 11 and a minimum score of 0, and the average score was calculated. In the attitude section, there were five-choice answers that scored 0–4 points per question, and a total score was at least 0 and a maximum score was 40. In the expertise section, the answer to question 27 was 0 or 1, and the remaining questions were scored from 0 to 5, and the total score was at least 0 and at most 30. The final question was also designed to determine the most consumable mouthwash. Data were entered into SPSS software and tested by *t*-test, Spearman, one-way variance, and least significant difference test. The significance level was <0.05.

## RESULTS

Of the 214 participating nurses, 38 (17.8%) were male and 176 females (82.2%). Most of the

educational degrees were B. A (86%), and most of the participating nurses were from traumatic workplace (32.7%). The majority of the nurses had a working experience of <5 years (66.35%). The working shift of most of the nurses was ambulatory (85%). Demographic information is given in Table 1. about the answer to the question of the use of a clinical guide (oral checklist) for oral care, 104 nurses responded (48.6%) were positively and 110 (51.4%) responded negatively. In response to the question of the type of mouthwash used, 170 (79.4%) nurses used chlorhexidine and 44 (20.6%) nurses used normal saline most of the time.

The mean score of knowledge, attitude, and practice obtained is presented in Table 2 (disaggregated by gender). *t*-test showed that there was a significant difference between knowledge and practice scores in both sexes ( $P = 0.04$ ,  $P = 0.048$ ), but there was no significant difference in attitude score in both sexes ( $P = 0.415$ ).

The Spearman correlation coefficient of knowledge, attitude, and practice scores of nurses with degree and work experience is presented in Table 3. The findings showed that there was a significant direct relationship between the educational level and the knowledge ( $r = 0.3$ ,  $P < 0.001$ ), and other relationships were not statistically significant.

One-way analysis of variance showed that there was no significant difference between knowledge and attitude scores in nurses working in different parts ( $P = 0.41$ ,  $P = 0.51$ ), but this difference was significant for practice score ( $P < 0.001$ ). The Spearman correlation coefficient for knowledge, attitude, and practice is presented in Table 4. The findings showed that there was an inverse and significant relationship between knowledge and practice ( $P = 0.03$ ), attitude with practice ( $P = 0.03$ ), and practice with knowledge and attitude ( $P = 0.03$ ).

## DISCUSSION

The general purpose of this study was to determine the mean score of knowledge, attitude, and practice of ICU nurses about oral care of patients according to some demographic and educational characteristics. In this study, 33.3% of nurses information about oral care standards was not enough and 33.6% did not have any idea about it. Berry and Davidson<sup>[21]</sup> in 2006, considered that the knowledge of ICU's nurses in relation to oral care was not acceptable and only

**Table 1: Demographic data of nurses working in intensive care units based on the number of participants**

Demographic information	n (%) of frequency
Sex	
Male	38 (8.17)
Female	176 (2.82)
Degree of education	
Assistant degree	16 (5.7)
Bachelor degree	184 (86)
Masters	14 (5.6)
Special ICU	
Nerves	52 (3.24)
Trauma	70 (7.32)
Surgery	30 (14)
Internal	6 (8.2)
Heart	14 (55.6)
General	42 (65.19)
Nursing work experience (years)	
<5	142 (35.66)
5-10	54 (2.25)
10-15	12 (65.5)
15-20	6 (8.2)
Shift work	
Fixed	32 (15)
Circulation	182 (85)

ICU: Intensive care unit

**Table 2: Average score of attitude, knowledge, and practice of nurses according to answering the questionnaire**

Parameter	Mean±SD		P (t-test)
	Female	Male	
Knowledge	2.01±8.10	2.56±6.10	0.04
Attitude	4.20±22.16	2.63±21.58	0.415
Practice	5.20±10.8	5.26±8.64	0.048

SD: Standard deviation

**Table 3: Relationship between scores of knowledge, attitude, and practice with academic qualifications and work experience, based on Spearman correlation coefficient**

Parameter	Work experience	Degree of education
Knowledge	-0.05	0.3
P	0.42	0-≤0.001
Attitude	0.09	0.101
P	0.16	0.14
Practice	0.11	-0.11
P	0.08	0.1

42% had the desirable information. In another study by Grap *et al.* (2003), the level of awareness of nurses working in the ICU was not acceptable and 48% had enough information.

**Table 4: Relationship between scores of knowledge, attitude, and practice with each other**

Parameter	Practice	Attitude	Knowledge
Knowledge	-0.14	-0.05	1.00
<i>P</i>	0.03	0.418	0.00
Attitude	0.14	0.001	-0.05
<i>P</i>	0.03	0.00	0.41
Practice	1.00	0.14	0.14
<i>P</i>	0.00	0.03	0.03

Oral care for patients admitted to the ICU is usually difficult for various reasons, such as the level of consciousness of patients and the connection to oxygen, and inaccuracies during work may create problems for the patient. This will depend on the skills and experience of the nurses, and those who have sufficient experience in this field can do this with the least complications and in a short time. In the present study, 49.5% of nurses considered cleaning of oral cavity as a hard task. These figures were 52.3% in Ranjbar *et al.* study and 61% in the study by Rello *et al.*<sup>[2,16]</sup>

In response to the question that nurses cared for oral care in ICU, only 34.7% of the nurses agreed and 34.3% opposed, but in the study of Ganz *et al.*,<sup>[22]</sup> only 21% of nurses were agreed with this task. In Ranjbar *et al.*,<sup>[16]</sup> 55.2% of nurses preferred a dental hygienist to do this task. In ICU units, a significant number of nurses did not do this task due to various reasons including not having enough time to do this, and in some cases, oral and dental hygiene are delivered to the family and patients' companions. However, due to the lack of awareness of the patient's companions, their actions may end up at the expense of the patient and may lead to secondary infections in the patient.

In this study, 38.3% of nurses agreed that ICU nurses' information about oral care standards was not enough. Furthermore, 66.3% of nurses agreed to hold oral care workshops for nurses and it indicated that nurses were aware of their lack of information about oral care. Moreover, in the study by Ranjbar *et al.*,<sup>[16]</sup> also 77.4% of nurses acknowledged that they needed more information on oral care standards and related courses, as well as 57.2% of them said that participation in oral care workshops is of their priorities. The findings indicate that nurses are aware of their lack of information about oral care standards and they tend to see more training. It is the task of the relevant organizations to provide the necessary knowledge for nurses in various forms in the training courses.

Of the nurses participating in this study, 43.9% agreed that the oral electric toothbrush would better control oral hygiene in ICU patients, but in Rangier *et al.*, 27% of nurses preferred electric toothbrushes to manual toothbrushes.<sup>[16]</sup> 57.9% of nurses in the study reported that they used a manual toothbrush for oral care. In Ranjbar *et al.* study,<sup>[16]</sup> 10.2% of nurses used manual toothbrushes, and in a study by Johnstone *et al.*,<sup>[23]</sup> 38% of nurses used manual toothbrushes, but in the study of Binkley *et al.*,<sup>[24]</sup> 88% of nurses used a manual toothbrush. As this is clear from the results, our nurses had a modest use of toothbrushes, which is a remarkable point in oral care.

Among all oral care methods, mouthwashes were the most commonly used (95.3%). In Ranjbar *et al.*,<sup>[16]</sup> 98% of nurses used mouthwashes, but in the study by Feider *et al.*,<sup>[25]</sup> the use of swab was more common than other methods. Among mouthwashes, 79.4% of nurses use chlorhexidine mouthwash and 20.6% used normal saline. In the study of Ganz *et al.*,<sup>[22]</sup> chlorhexidine was the most commonly used mouthwash.

In the present study, the score of knowledge and practice of female nurses was higher than that of male nurses, and there was a significant difference between two sexes, but the attitude score of two sexes did not have a significant difference. Therefore, efforts should be made to improve the level of knowledge and practice of male nurses. Regarding the degree of education, the results showed that there is a significant relationship between the degree of education and the knowledge of nurses, so that by increasing academic degree, the nurse knowledge increases too, so more courses should be provided to increase the knowledge of nurses with a lower educational degree. Therefore, in order to make the findings more reliable, a high-volume study should be conducted to determine the validity of the findings of the present study.

## CONCLUSION

Findings showed that the occupational and educational demographic characteristics of nurses in ICUs have different effects on their knowledge, attitude, and practice regarding oral care in ICU patients. The data showed that the knowledge and the practice of female nurses on oral care of patients compared to male nurses were higher, but there was no significant difference between attitudes in both sexes. Furthermore, nurses with lower educational

qualifications had less knowledge about this, but the attitude and practice of nurses with different degrees did not differ. The practice of nurses working in different ICUs was different, but they had the same knowledge and attitude.

### Financial support and sponsorship

Nil.

### Conflicts of interest

The authors of this manuscript declare that they have no conflicts of interest, real or perceived, financial or nonfinancial in this article.

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