

Original Research Article

Assessment of knowledge, attitude and practice of nurses about oral health care in Intensive care unit patients (a cross-sectional study)

Marzieh Karimi Afshar¹, Molook Torabi², Omid Ali Didar³, Mehrnaz Karimi Afshar⁴

¹Assistant Professor, Department of Orthodontics, School of Dentistry, Kerman University of Medical Sciences, Kerman, Iran

²Associate Professor, Department of Oral and Maxillofacial Pathology, School of Dentistry, Kerman University of Medical Sciences, Kerman, Iran

³Dentist, School of Dentistry, Kerman University of Medical Sciences, Kerman, Iran

⁴Resident of Prosthodontics, Tehran University of Medical Sciences, Tehran, Iran

*Corresponding author

Molook Torabi

Email: m.torabi.p@gmail.com

Abstract: Intensive care unit (ICU) patients especially those are on mechanical ventilation, have complex oral care needs. Inadequate oral care may be predispose ICU patients to nosocomial infections. The aim of this study was to assess the attitudes, knowledge, and practice of ICU nurses (Kerman, Iran). This cross-sectional study was conducted on 70 nurses working in ICU departments. Data were collected by a valid and reliable questionnaire in 6 parts (demographic data, knowledge, attitude, practice and self-assessment questions). Data were analyzed by SPSS 11.5 software using χ^2 and t tests. P value considered at 0.05% significant level. Eighty four and three percent were women and 15.7% were men. The mean age was 28.5 ± 4.3 years. Twenty eight and six percent, 64.3% of participants had good knowledge and practice about oral hygiene in ICU patients respectively. Forty percent had positive attitude to oral hygiene in ICU patients. Chlorhexidine mouth wash were routinely used by 100% of nurses. Thirty five and seven percent of nurses had received training in ICU patient's oral care. Based on the results of the present study knowledge about ICU patients oral care was low and practice is favorite. Nurses require more education for management the oral care of ICU patients effectively. Further research is recommended.

Keywords: Attitudes, knowledge, practice, nurses, ICU, VAP, Kerman

INTRODUCTION:

Oral health can compromise by medical conditions, medical treatments, patient disability for oral health behavior, and intensive care unit (ICU) instruments. Oral microflora of ICU patients is consist of gram positive microorganism such as staphylococcus aureus, streptococcus pneumonia and pseudomonas. These microorganisms are potentially risk factors for ventilator associates pneumonia (VAP) [1, 2]. Bacterial colonization from oral to trachea is one of the most important risk factors for Nosocomial pneumonia in intubated patients. Dental plaque bacteria are a focal infection that developed to VAP [3, 4].

The endotracheal tube works as a conductor of the microorganisms of the oropharynx to the lower respiratory tract, and these are frequent etiology of the nosocomial pneumonia [5-7]. 9% to 40% of infections acquired in the ICU are VAP, and are related to increased length of hospital stay, higher mortality and morbidity which significantly affects hospital costs [8-

9]. Oral cleaning is one of methods for decrease risk to VAP [3, 4]. Many studies designed to prove the role of mechanical cleansing of dental plaque and its association with the reduction of VAP [10-12]. Dental plaque Removal methods for ICU patients are mechanical and chemical such as lemon, water, wet sponge, mouth washes such as hydrogen peroxide, sodium bicarbonate and chlorhexidine [13]. Oral health is one of important issue in nursing aspect that focused on health and patients' comfort in long and short time. Oral health care is a common nurses' duty in ICU [14].

ICU patients for oral care are completely depended on nurses [15]. Binkley *et al.*; showed oral care in ICU patients by 90% of nurses were wet sponge and mouth washes [16]. It is shown topical application of Chlorhexidine, initiated before intubation, reduces nosocomial infections in patients submitted to elective cardiac surgery [17, 18]. Oral health care in educational program nursing were low [19, 20]. Rello *et al.*; shows,

ICU oral care was important issue in In European hospitals. They concluded using tooth brush in ICU patients must be considered [21]. Vidal etal showed among patients in ICU, whose undergoing tooth brushing there was a significant reduction in duration of mechanical ventilation, and reduction the incidence of VAP and length of ICU stay [22]. No difference was observed between manual or electric tooth brushing. There were no statistically significant differences regarding hospital mortality or lengths of ICU stay [23]. As oral health and oral care are important in patients in ICU, the aim of the present study was to determine knowledge, attitude and practice of nurses who work in ICU in Kerman (south-east Iran) about oral health care in ICU patients.

METHOD AND MATERIAL:

A 29 –item valid and reliable questionnaire based on previous studies was used [16, 21]. The sample size was nurses in ICU in Kerman hospitals in south-east Iran ,who selected by census sampling method .The questionnaire consisted of 5 parts : (a) demographic data (b) 10 knowledge questions and 2 scenario about oral health care in ICU patients ,(c) 8 attitude item about oral health care in ICU patients,(d) 4 item about frequency and type of care provided to ICU patients ,(e) 4 self-assessment item about oral health care in ICU patients [16].

Knowledge scoring assessed by yes, no, don't know response (10 questions) and including the following scenario in the questionnaire: “An 18-year old male was involved in a vehicle accident five days ago and was admitted to your ICU. He has been mechanically ventilated since admission and has now developed pneumonia.” The respondent had to assess the likelihood on a scale of 1–10 regarding each of the following being the mechanism of disease: (a)

aspiration of contaminated oropharyngeal secretions from oropharynx, (b) transmission from health care workers hands, (c) transmission from contaminated respiratory equipment, (d) preadmission colonization, and finally transmission from other patients. Attitude assessed by a five-point Likert scale ranging from “strongly agree” (= 5) to “strongly disagree” (= 1).Practice assessed by the methods used for ICU patients oral care. Nurses were asked about the frequency of the use the following supplies: foam swabs, manual tooth brushes electric tooth brushes, moisture agents, toothpaste, and mouthwash. If mouthwash was used, respondents were asked to identify the type.

Two questions were about previous oral care training, and two were about respondents’ attitudes towards additional oral care information and training. For the assessment of hospital’s policy regarding oral care and the availability and adequacy of oral care supplies the respondents were asked five questions to answered on a Likert scale ranging from “strongly agree” (= 5) to “strongly disagree” (= 1). Data analyzed in SPSS software by T test and chi² test .P value considered as 0.05 significant levels.

RESULTS:

From 70 participant 11 (15.7%) were men and 59 (84.3%) were women with mean age 28.1±4.8 years. The mean years of working were 6.1±4.4 years and mean years of working in ICU were4.7±3.2 years. The main source (68.57%) of oral hygiene education was in –service experience (table 1).

Diagram 1 show the rate of knowledge, attitude and practice of nurses about oral hygiene of ICU patients

Table 1: Frequency of demographic data of participants

variable		no	%
sex	male	11	15.71
	female	59	84.28
Educational level	3 year degree	4	5.71
	Master degree	66	94.28
Type of hospital	academic	53	75.71
	Non academic	17	24.28
Source Oral care education	University /academic	10	14.28
	Self –taught	5	7.14
	Continuing education	7	10.00
	In-service	48	68.57
Shift pattern	Fix	34	48.57
	rotating	36	51.42

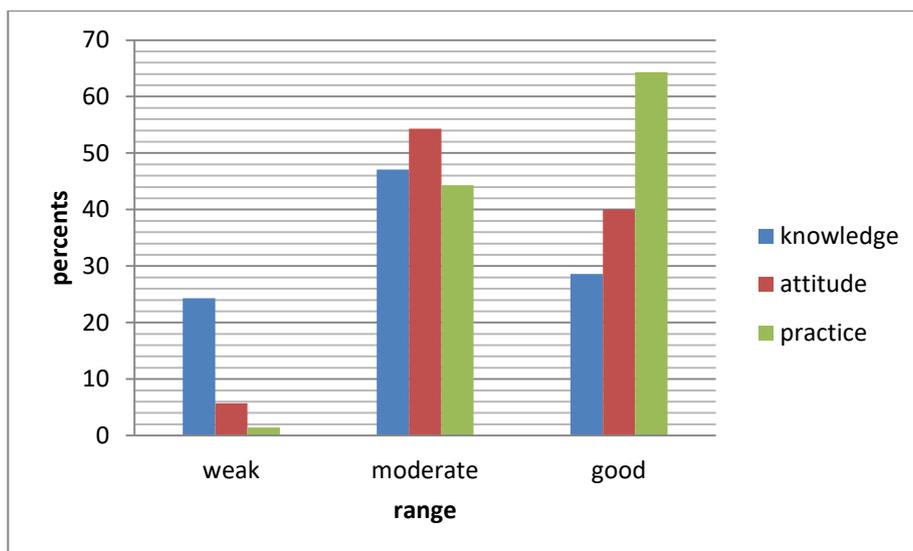


Fig 1: Range of knowledge, attitude and practice

Chlorhexidine mouth wash was the most frequent material (98%) for oral hygiene. None of nurses used tooth brushes. 23.7% of participants didn't know the correct frequency of cleaning the patients' mouth and teeth. 21.42% of nurses believed Oral care is not a very high priority. There was not significant correlation between knowledge and attitude of nurses about oral hygiene of ICU patients. There was not significant correlation between practice and attitude of

nurses about oral hygiene of ICU patients. There was not significant correlation between knowledge and practice of nurses about oral hygiene of ICU patients. Nurses in academic hospitals had better practice. This difference was significant ($p=0.001$). 40% of nurses believed they have good competency, and 48.6% very interested to know the best method for oral hygiene. Table 2 show self-assessment of nurses about oral hygiene of ICU patients.

Table 2: Frequency of participants based on self-assessment questions

Self-assessment	Excellent		Very good		good		moderate		weak	
	no	%	no	%	no	%	no	%	no	%
How do you assess your potency for oral health care in ICU patients?	7	10	7	10	28	40	19	27.1	9	12.8
How much do you interest to know the best method for oral care in ICU patients?	Very strong		strong		moderate		low			
	no	%	no	%	no	%	no	%		
	34	46.6	23	32.9	12	17.1	1	1.4		
I need more tools and supplies	Strong agree		agree		No idea		disagree		Strong disagree	
	no	%	no	%	no	%	no	%	no	%
	3	4.3	20	28.5	18	25.7	20	28.6	9	12.8

There was significant correlation between type of hospitals and participant practice ($p = 0.001$). There was no correlation between knowledge and practice and attitude.

DISCUSSION:

Oral health care is one of the health providers' main tasks for ICU patients [2]. The primary aim of the oral health in ICU patients is to minimize dental plaque formation and accumulation of oropharyngeal debris as these create an ideal environment for pathogenic micro-organisms that may cause such conditions as stomatitis and gingivitis [24, 25]. The results of the present study showed 24.3% of nurses had weak knowledge about oral health in ICU patients. Oral health in ICU patient is

very important in European hospitals [21]. So it seems knowledge in nurses should be improved. Nurses education about oral health in ICU patients significant decreasing in incidence of VAP observed [26]. 26.9% of nurses didn't know oral care in ICU patients should be continuing until clear from ICU. 23.7% didn't know oral health care must be done every 6 hours. Hannemann and Cusick found that daily rates of oral care in intubated and non-intubated patients were 3.3 and 1.8, respectively [27]. Daily frequency of oral health care in ICU patients a controversy issue. Day believe frequency of oral health care in ICU patients, should be done based on at risk patients [28]. In the present study 100% of nurses used chlorhexidine mouth wash. In Rello *et al.*; study 61% used chlorhexidine

mouth wash [21]. Mouth washing with chlorhexidine has been associated with a decrease in dental plaque formation [29]. In the present study none of participant use tooth brush. Rello *et al.* showed 40% of European ICU nurses used tooth brush [21]. Mori *et al.*; found a reduced risk of VAP when using a 20-fold diluted povidone-iodine gargle combined with manual toothbrushes every 8 h [30]. The use of tooth brushes should be given more attention as these are used only rarely while being more effective for thoroughly cleaning of the oral cavity. In the present study significant differences are seen between academic hospitals and other type of hospital in practice area. It may be due to these hospitals are centers for education of nurses. Attitude toward oral care in ICU patients in 40% was positive. With training the nurses their attitude becomes more positive. In the present study 81.5% were very strong and strong interested to know the best method for oral care in ICU patients? This finding is compatible with Binkely *et al.*; [16]. In our study in 45.73% of participant at service was the source of knowledge. In Binkely *et al.*; was 30% [16].

CONCLUSION:

Based the results of the present study overall knowledge was low, practice were favorite, and attitude was positive. A standard protocol oral health care in ICU patients should be done in all ICUs. Nurses should be encouraged for using tooth brushes for ICU patients.

Acknowledgments:

The authors hereby would like to thank the research deputy of Kerman University of Medical Sciences for approval and financial support of this project.

REFERENCES:

1. Munro CL, Grap MJ. Oral health and care in the intensive care unit: state of the science. *American Journal of critical care.* 2004 Jan 1; 13(1):25-34.
2. Abele-Horn M, Dauber A, Bauernfeind A, Russwurm W, Seyfarth-Metzger I, Gleich P, Ruckdeschel G. Decrease in nosocomial pneumonia in ventilated patients by selective oropharyngeal decontamination (SOD). *Intensive care medicine.* 1997 Feb 1; 23(2):187-95.
3. Fourrier F, Duvivier B, Boutigny H, Roussel-Delvallez M, Chopin C. Colonization of dental plaque: a source of nosocomial infections in intensive care unit patients. *Critical care medicine.* 1998 Feb 1; 26(2):301-8.
4. Garrouste-Orgeas M, Chevret S, Arlet G, Marie O, Rouveau M, Popoff N, Schlemmer B. Oropharyngeal or gastric colonization and nosocomial pneumonia in adult intensive care unit patients: a prospective study based on genomic DNA analysis. *American journal of respiratory and critical care medicine.* 1997 Nov 1; 156(5):1647-55.
5. Scannapieco FA, Stewart EM, Mylotte JM. Colonization of dental plaque by respiratory pathogens in medical intensive care patients. *Critical care medicine.* 1992 Jun 1; 20(6):740-5.
6. Fourrier F, Duvivier B, Boutigny H, Roussel-Delvallez M, Chopin C. Colonization of dental plaque: a source of nosocomial infections in intensive care unit patients. *Critical care medicine.* 1998 Feb 1; 26(2):301-8.
7. Grap MJ, Munro CL, Elswick RK, Sessler CN, Ward KR. Duration of action of a single, early oral application of chlorhexidine on oral microbial flora in mechanically ventilated patients: a pilot study. *Heart & Lung: The Journal of Acute and Critical Care.* 2004 Apr 30; 33(2):83-91.
8. Byers JF, Sole ML. Analysis of factors related to the development of ventilator-associated pneumonia: use of existing databases. *American Journal of Critical Care.* 2000 Sep 1; 9(5):344.
9. Tablan OC, Anderson LJ, Besser R, Bridges C, Hajjeh R. Guidelines for preventing healthcare-associated pneumonia, 2003. *MMWR.* 2004; 53(RR-3):1-36.
10. Halm MA, Armola R. Effect of oral care on bacterial colonization and ventilator-associated pneumonia. *American Journal of critical care.* 2009 May 1; 18(3):275-8.
11. Munro CL, Grap MJ, Jones DJ, McClish DK, Sessler CN. Chlorhexidine, toothbrushing, and preventing ventilator-associated pneumonia in critically ill adults. *American Journal of Critical Care.* 2009 Sep 1; 18(5):428-37.
12. Pobo A, Lisboa T, Rodriguez A, Sole R, Magret M, Treffer S, Gómez F, Rello J. A randomized trial of dental brushing for preventing ventilator-associated pneumonia. *CHEST Journal.* 2009 Aug 1; 136(2):433-9.
13. Berry AM, Davidson PM. Beyond comfort: oral hygiene as a critical nursing activity in the intensive care unit. *Intensive and Critical Care Nursing.* 2006 Dec 31; 22(6):318-28.
14. Dennesen P, Van Der Ven A, Vlasveld M, Lokker L, Ramsay G, Kessels A, van den Keijbus P, van Nieuw Amerongen A, Veerman E. Inadequate salivary flow and poor oral mucosal status in intubated intensive care unit patients. *Critical care medicine.* 2003 Mar 1; 31(3):781-6.
15. Jones H, Newton T, Bower J. A survey of the oral care practices of intensive care nurses. *Intensive and Critical Care Nursing.* 2004; 20(2):69-76.
16. Binkely C, Furr A, Carrico R, Mc Curren. Survey of oral care practices in US intensive care units. *American Journal of Infection control.* 2004; 32(3):161-169.
17. Houston S, Hougland P, Anderson JJ, LaRocco M, Kennedy V, Gentry LO. Effectiveness of 0.12% chlorhexidine gluconate oral rinse in reducing prevalence of nosocomial pneumonia in patients undergoing heart surgery. *Am J Crit Care.* 2002; 11:567-70.

18. Segers P, Speekenbrink RG, Ubbink DT, van Ogtrop ML, de Mol BA. Prevention of nosocomial infection in cardiac surgery by decontamination of the nasopharynx and oropharynx with chlorhexidine gluconate: a randomized controlled trial. *JAMA*. 2006; 296:2460–6.
19. Mc Neill HE. Biting back at poor oral hygiene. *Intensive Crit Care Nurs*. 1993;9:246-252.
20. Longhurst RH. A cross-sectional study of the oral healthcare instruction given to nurses during their basic training. *British dental journal*. 1998 May; 184(9):453-7.
21. Rello J, Koulenti D, Blot S, Sierra R, Diaz E, De Waele JJ, Macor A, Agbaht K, Rodriguez A. Oral care practices in intensive care units: a survey of 59 European ICUs. *Intensive care medicine*. 2007 Jun 1; 33(6):1066-70.
22. de Lacerda Vidal CF, de Lacerda Vidal AK, de Moura Monteiro JG, Cavalcanti A, da Costa Henriques AP, Oliveira M, Godoy M, Coutinho M, Sobral PD, Vilela CÂ, Gomes B. Impact of oral hygiene involving toothbrushing versus chlorhexidine in the prevention of ventilator-associated pneumonia: a randomized study. *BMC infectious diseases*. 2017 Jan 31; 17(1):112.
23. Alhazzani W, Smith O, Muscedere J, Medd J, Cook D. Tooth brushing for critically ill mechanically ventilated patients: a systematic review and meta-analysis of randomized trials evaluating ventilator-associated pneumonia. *Critical care medicine*. 2013 Feb 1; 41(2):646-55.
24. Loesche WJ. Association of the oral flora with important medical diseases. *Current opinion in periodontology*. 1996 Dec; 4:21-8.
25. Goldie SJ, Kiernan-Troidle L, Torres C, Gorban-Brennan N, Dunne D, Klinger AS, Finkelstein FO. Fungal peritonitis in a large chronic peritoneal dialysis population: a report of 55 episodes. *American journal of kidney diseases*. 1996 Jul 1; 28(1):86-91.
26. Zack JE, Garrison T, Trovillion E, Clinkscale D, Coopersmith CM, Fraser VJ, Kollef MH. Effect of an education program aimed at reducing the occurrence of ventilator-associated pneumonia. *Critical care medicine*. 2002 Nov 1; 30(11):2407-12.
27. Hanneman SK, Gusick GM. Frequency of oral care and positioning of patients in critical care: a replication study. *American Journal of Critical Care*. 2005 Sep 1; 14(5):378-86.
28. Day R. Mouth care in an intensive care unit: a review. *Intensive and Critical Care Nursing*. 1993 Jan 1;9(4):246-52.
29. Fourrier F, Cau-Pottier E, Boutigny H, Roussel-Delvallez M, Jourdain M, Chopin C. Effects of dental plaque antiseptic decontamination on bacterial colonization and nosocomial infections in critically ill patients. *Intensive care medicine*. 2000 Sep 1; 26(9):1239-47.
30. Mori H, Hirasawa H, Oda S, Shiga H, Matsuda K, Nakamura M. Oral care reduces incidence of ventilator-associated pneumonia in ICU populations. *Intensive care medicine*. 2006 Feb 1; 32(2):230-6.