

Awareness and oral care provided by intensive care nurses – a multi-centred, cross-sectional study

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The patients in the intensive care units (ICU) require constant close monitoring and support from the nurses to ensure day-to-day maintenance of bodily functions including routine oral care [1,2]. Life-saving intubations and elderly or immunocompromised status may make the provision of oral care at ICUs more challenging as these could compromise the effective plaque control further deteriorating the oral health [3].

“Dental plaque” is a highly organized biofilm that could be formed on non-shedding surfaces within the oral environment. Depending on the environmental factors, the diversity of the biofilm could be changed [4]. The systemic effects of dental plaque are related to their ability to translocate into other organs and also due to bacterial products that initiate the immuno-inflammatory reactions. The oral cavity may also act as a reservoir for pathogens from nearby organs/sites such as the lungs. These closer relationships may lead to oral pathogens involving ventilator-associated pneumonia and other secondary infections [5]. Thus, oral health maintenance is imperative in ICU patients to reduce the risk of nosocomial infections and to improve the management outcome [3,6]. It is also well evident that oral health is important for general well-being [7].

The delivery of oral care should be always customized based on the oral health status of an individual. A basic understanding of etiological factors for common oral diseases and the knowledge of essential oral health care practices would be highly beneficial for nurses to deliver oral care effectively [6]. Hence, this could indirectly assist in reducing the occurrence of ventilator-associated pneumonia and other systemic diseases such as infective endocarditis, heart disease, stroke and lung cancer [4,8]. Furthermore, good oral health can make the patients

comfortable, avoid halitosis and promote the overall quality of life of the patients [9]. Therefore, this study aimed to assess the awareness of oral assessment and oral care provided by nurses in ICUs.

A descriptive cross-sectional analysis was done among 220 nurses engaged in adult care at all ICUs of the main three tertiary care hospitals in Kandy district: National Hospital Kandy, Peradeniya Teaching Hospital and Dental (Teaching) Hospital, Peradeniya, Sri Lanka. The content-validated, pre-tested questionnaire was used covering the aspects of demographic data, awareness of the provision of oral care for ICU patients and the delivered oral care practices. This study was approved by the Ethics Review Committee of the Faculty of Allied Health Sciences, University of Peradeniya (Reference no: AHS/ERC/2021/021).

A total of 153 (69.6%) ICU nurses responded to the survey. The majority of them (n=144) were females (95.4%) and the mean age was 36.78 (SD = ±7.16) years. According to the educational qualifications, the majority of them held a diploma in Nursing (76.5%) and 20.9% of them had a Bachelor of Science Degree in Nursing. The work experience in the ICU ranged from 1-24 years. 81 were in the 1-5 years of working experience category and the majority were diploma holders (n=62, 76.5%). However, only 20 (13.1%) participants had undergone special training on oral care which have been received mostly as workshops (n=12, 46%).

Only 35.9% (n=55) of the participants had the correct understanding of dental plaque. Moreover, more than half of them (n=78, 51.0%) selected cotton as the best tool to clean teeth instead of a toothbrush (n=50, 32.7%) (Table 1).

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Table 1. Participants' responses to the questions about awareness of oral care

<i>Question</i>	<i>Correctly answered n (%)</i>
Certain types of antihypertensive drugs can affect the gums	76 (49.7)
Use of mouthwash can remove most of the germs from the mouth	19 (12.4)
Plaque can be easily removed with a toothbrush	72 (47.1)
Dental abscess cannot be a life-threatening disease condition	101 (66.0)
What is the appropriate concentration of chlorhexidine when using it as an oral cleaning solution?	71 (46.4)
Which disease/diseases can be caused by poor oral health in ventilated patients?	8 (5.2)
What are the features of an ideal oral cleaning solution?	8 (5.2)
What is the appropriate concentration of chlorhexidine when using it as an oral cleaning solution?	71 (46.4)
What is the best tool to clean the teeth of patients?	50 (32.7)

Significant higher overall scores ($p=0.044$, independent sample t-test) were observed among the bachelor graduate nurses (mean 55.61, $SD=\pm 13.16$) compared to diploma holders (mean 50.90, $SD=\pm 11.18$) as well as in those who had working experience of 1-5 years (mean 56.81, $SD=\pm 10.85$) compared to the participants with >5 years (mean 50.06, $SD=\pm 11.58$), ($p=0.002$, independent sample t-test). According to the type of ICUs, dental ward ICU nurses had the highest mean score value (61.02, $SD=\pm 11.63$) compared to others ($p<0.001$, independent sample Kruskal Wallis test).

More than half of the participants seemed to deliver oral care ($n=99$, 64.7%), mostly using a cotton swab/gauze pad and mouthwash (92.7%). Only 28.9% used a toothbrush with or without toothpaste during routine oral care. Cleaning dentures was not routinely practised. Most of the participants ($n=150$, 98%) reported carrying out routine oral assessments with a frequency of every 6-12 hours ($n=117$, 79.6%). 54.1% ($n=80$) of the participants stated that they follow guidelines to provide oral care.

Dental plaque is best removed by mechanical means which could be simply achieved by correct brushing technique. The less knowledge and understanding regarding dental plaque may have contributed to the low awareness of the most suitable way to remove plaque thus lesser use of toothbrushes in practice.

Moreover, the awareness of drugs affecting oral health, use of mouthwash, dental abscesses, features of ideal oral cleaning solution, concentration of chlorhexidine digluconate preparation and oral-systemic health links were not satisfactory among the participants.

The educational qualifications, years of work experience, and the ICU speciality were identified as significant factors affecting awareness level. The work experience also reflects the number of years following

completion of the primary nursing qualification. Therefore, better knowledge observed in the 1-5 years of work experience category may be due to the less time gap from graduation. The changes in the curriculum content as well as the delivery of the course may have contributed to the higher knowledge of the bachelors degree holders. Similar findings were also observed in the literature [10].

These findings highlight the importance of continuous educational programmes to deliver timely updates on the evidence-based practices required. Further, considering the available facilities in the Sri Lankan context, the formulation of oral care guidelines for ICU patients is also important. The identified knowledge gaps should be considered in curriculum revisions and it would be beneficial to include special training on oral care.

Authors contribution

Sritharan Karthik: conceptualization, methodology, data collection, analysis, writing of initial draft and editing. Dhanushka Leuke Bandara: supervision (primary), conceptualization, methodology, analysis, writing-reviewing and editing. P.H.G.J. Pushpakurmara: supervision, methodology, analysis, interpretation, writing-reviewing and editing. All authors unanimously approved the final version.

Conflict of interests

The authors declare no conflict of interests.

Ethics approval

This study was approved by the Ethics Review Committee of the Faculty of Allied Health Sciences, University of Peradeniya (Reference no: AHS/ERC/2021/021).

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