

Research Article

Knowledge and attitudes of pediatric nurses regarding oral health care for hospitalized children in Riyadh, Saudi Arabia

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Abstract

Background: Pediatric nurses are in a unique position to provide oral health care to hospitalized children and help in the prevention and management of oral diseases. The objectives of this study were to determine pediatric nurses' level of oral health knowledge and to evaluate their attitude towards the prevention of oral diseases and willingness to obtain more oral health education and training.

Methods: A cross-sectional study was conducted at 6 randomly selected hospitals in Riyadh city, Saudi Arabia. A self-administrated questionnaire with items including demographic data, dental knowledge, attitude, and willingness to obtain more information and training was completed by 240 pediatric nurses working in different pediatric medical wards.

Results: On average, 64% of surveyed pediatric nurses had acceptable dental knowledge. Only 79% of nurses assess patients' mouths on admission. About 77% of nurses claimed to receive instructions regarding oral care before qualification and 72% after qualification. However, 91% showed great attitudes and interest in providing oral care to hospitalized children and were willing to obtain more information about oral health care for children.

Conclusion: Pediatric nurses working in Riyadh hospitals had limited oral health knowledge, however, they showed good awareness and a positive attitude toward promoting oral health care to hospitalized children.

Introduction

Dental caries is one of the most common conditions affecting the general health of children in Saudi Arabia with caries prevalence of 72.6% in primary dentition [1]. Hospitalized children in Riyadh, Saudi Arabia are more likely to have caries on their primary dentitions compared to non-hospitalized children; and the periodontal condition of hospitalized children has deteriorated in terms of plaque accumulation and severity of gingival inflammation [2]. Hospitalized children are exposed to a number of risk factors that can harmfully affect their oral health. Several risk factors for dental caries were observed among hospitalized children such as poor oral hygiene, low schooling, and income of the parent/guardian [3]. In addition, dental caries and periodontal disease become more significant with longer periods of hospitalization [4]. Further, changes in mealtimes and eating habits, the introduction of cariogenic medications

into the daily routine, the stress caused by hospitalization and an unwillingness to perform oral hygiene are all factors influencing the oral health status of hospitalized children [5].

Children who are hospitalized for an illness may have lethargy or malaise, and oral hygiene often becomes secondary to their medical problems. Oral health care has often been overlooked and neglected especially by non-dental health providers [6]. Pediatric nurses are in a unique position as they play a significant role in the delivery of oral health care to all children. In monitoring the oral health care of hospitalized children, pediatric nurses have a fundamental role and should be guided and made aware of their responsibility regarding the oral health of their hospitalized children [6].

The most frequent causes of hospital admission among children in Riyadh were infections, followed by blood

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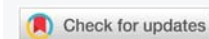
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disorders, allergies and immune disorders [2]. These medical conditions impact oral health, making children more vulnerable to poor oral health outcomes. Some conditions are readily identifiable by nurses, such as Ventilator-Assisted Pneumonia (VAP) occurring in intubated patients, or immune dysfunction increasing susceptibility to infection [7].

Also, many hospitalized children receive medications. Most liquid drugs for children now contain sugar or artificial sweeteners or sugar replacers (such as sorbitol, mannitol, or xylitol), which are non-cariogenic. Sugar replacers additionally have cavity prevention properties, and should be given whenever possible, especially with repeated use of drugs [8].

Nurses need to identify children at risk for poor oral hygiene and ensure that they receive adequate oral health care. In addition, nurses need to be mindful of oral complications of dental care neglect which can be both acute and severe, often requiring additional supportive therapy. They may delay treatment like in oncology patients or become dose-limiting, increase hospital admission, increase cost, and decrease quality of life [9].

Nurses working with hospitalized children are available and are in regular contact with them and their parents. They are in a good position to promote oral health and endorse preventive measures for hospitalized children. However, several previous studies reported inadequate oral health knowledge among nurses required to promote oral health in hospitalized patients in different countries [10-12]. Therefore, the objectives of this part of the study were to determine pediatric nurses' level of oral health knowledge and evaluate their attitude toward the prevention of oral diseases in hospitalized children and their willingness to obtain more oral health education and training.

Materials and methods

After the approval of this study by the Research Ethics Committee in Prince Sultan Military Medical City (Reg. # HAP-01-R-015, Project No. 915) and by the College of Dentistry Research Center at King Saud University (FR0366), this survey was conducted using a self-administrated questionnaire with multiple choice and scale questions. Prior to starting the official survey, the questionnaire was tested with 5 nurses for the comprehensibility and completeness of the items and was designed to be filled out in a few minutes. The content validity of the questionnaire was evaluated by 2 experts in pediatric dentistry.

The questionnaire was divided into sections including demographic data of pediatric nurses, their dental knowledge, attitude and willingness to obtain more information and training. The demographics included age, gender, place of nursing school graduation, educational degree, type of practice, work experience, working duty and duration of

patients' stay. Nurses' assessment of patients' mouths on admission and receiving instructions regarding oral care before and after qualification was also assessed.

Knowledge questions included 12 multiple choice questions in pediatric dental knowledge and dentistry-related medical knowledge, whereas attitude items were measured on a five-point Likert scale using 6 statements describing the nurses' opinions about their role in preventing oral diseases and they're willingness to obtain more information and practice about oral health care for children.

A total of 250 questionnaires were distributed among pediatric nurses working in different pediatric medical wards (General pediatric, Pediatric Surgery, Pediatric Oncology, Pediatric hematology and Pediatric ICU) from 6 randomly selected governmental and private hospitals in Riyadh city, Saudi Arabia. Ethical approval and permission were obtained from the concerned hospitals. The sample participated in this cross-sectional study by filling out the questionnaire. The survey was voluntary and the responses were anonymous. The collected data were processed statistically using Stata 15. Answers were described using numbers and percentages. Nurses' knowledge and attitudes were analyzed and calculated by dividing the sum of the right answers/strongly agree and agree on answers on the number of items in each section.

Results

A total of 240 pediatric nurses returned the questionnaires with a response rate of 96%. About 94% of participating nurses were females and 75% of them had bachelor's degrees or higher (Table 1). Most of the nurses are working internal duty or day duty with very limited numbers fixed to the night shift. Nearly 53% of nurses are taking care of long-stay patients and they usually work in pediatric ICU, pediatric oncology, pediatric hematology and pediatric gastroenterology wards. The remaining nurses working with short-stay patients were mostly found in surgery and general pediatric wards. Only 79% of nurses assess patients' mouths on admission. About 77% of nurses claimed to receive instructions regarding oral care before qualification and 72% received oral health instructions after qualification (Figure 1).

There were 12 questions to test nurses' knowledge (Table 2). On average, 64% of surveyed pediatric nurses had

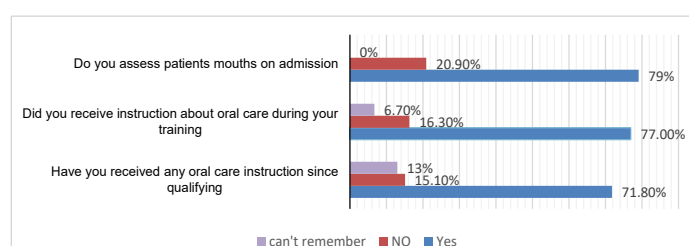


Figure 1: Percentage of nurses who assess patients' mouths on admission.



Table 1: Demographic Data of Pediatric Nurses.

Demographic variables	No. (%)
Gender	
Male	15 (6.2%)
Female	225 (93.8%)
*Age	
< 30 years	115 (47.9%)
31 - 40 years	68 (28.3%)
41 - 50 years	32 (13.3%)
> 51	17 (7 %)
*Place of nursing school graduation	
Government	110 (45.8%)
Private	125 (52%)
Educational degree	
2-year study	6 (2.5%)
Diploma	54 (22.5%)
Bachelor or higher	180 (75%)
Types of practice	
University Hospital	19 (7.9%)
Military Hospital	77 (32%)
Ministry of Health Hospital	93 (38.7%)
Security Forces Hospital	28 (11.6%)
Private Hospital	19 (7.9%)
Others	4 (1.6%)
Work experience	
< 5 years	69 (28.7%)
5 -10 years	85 (35.4%)
11 - 15 years	37 (15.4%)
16 - 20 years	28 (11.6%)
> 20 years	21 (8.7%)
*Working duty	
Night duty	13 (5.4%)
Day duty	97 (40.4%)
Internal duty	126 (52.5%)
*Duration of patients' stay	
Short stay patient	109 (45.4%)
Long stay patient	127 (52.9%)

*There are some missing data.

Table 2: Pediatric Nurses' Dental Knowledge.

Items	% of Corrected Answers
1- Children should visit the dentist for the first time at 1 year of age	68.9%
2-The first primary (baby) tooth erupts at 6 months of age	85.6%
3- The first Permanent tooth starts to erupt at 6-7 years of age	63.6%
4- How many times should a child brush his teeth per day? Three times	77.2%
5-At what age is a child can likely to brush his own teeth? 7-8 years of age	6.3%
6-What is the cause of gingivitis (Gum inflammation)? plaque & food particles	86.3%
7-Which of these sweeteners is tooth-friendly? Xylitol	18.6%
8-Bacteria that cause dental caries can transmit from the mother to the child. Yes	43%
9- Fluoride is used to: protect the teeth	64.3%
10-Do you think a bottle or breastfeeding can cause dental caries? Yes	54.9%
11-Numerous medical conditions impact oral health, making children more susceptible to poor oral health outcomes. Yes	86.1%
12- Some medications can cause mouth dryness or dental caries. Yes	90.7%
Section Percentage	64%

acceptable dental knowledge. However, the results showed a lack of nurses' general knowledge in oral health mostly in dental development in children, causes of decay, and the role of fluoride. The most wrongly answered questions were: at what age a child can likely brush his own teeth? Which of these sweeteners is tooth-friendly? And bacteria

Table 3: Pediatric Nurses' Attitudes Regarding Oral Care.

Items	% of Agreed Answers
1- Nurses could have an important role in preventing oral diseases in children	94.9%
2- Nurses should examine the oral cavity and teeth of hospitalized children	93.7%
3- I would like to implement preventive oral care in my daily work activity	89.8%
4- Oral health care delivered by nurses is not efficient	56.4%
5- I am willing to obtain more information about oral health care for children	91.6%
6- I am willing to have clinical hands-on training in oral examination and diagnosis of oral diseases	90.3%
Section Percentage	91%

that cause dental caries can transmit from the mother to the child. Nurses were more knowledgeable about the medical conditions impacting oral health and about medications that can cause mouth dryness or dental caries.

More than 91% of nurses showed great attitudes and interest in providing oral care to hospitalized children (Table 3). More than half of the nurses recognized that oral health care delivered by nurses is not efficient, however, the majority of nurses showed great interest and willingness to obtain more information and hands-on training.

Discussion

Oral care of hospitalized children is an important measure that aims to maintain and promote oral and dental health. The role of the pediatric nurse as a principal provider of oral care for hospitalized children cannot be underestimated. Such practice should become a routine part of their daily nursing responsibilities. However, delivery of quality oral care couldn't be achieved unless nurses are knowledgeable and well-trained in this regard. This should be combined with a positive attitude toward the importance of oral care for the well-being of hospitalized children.

Parents of children with chronic health conditions that require frequent and long hospitalization are usually overwhelmed by the child's condition and dental health of their low priority. This will lead to increase dental diseases and complicate dental treatment which might need further hospitalization. This could be prevented, as the child was under hospital care for years and was seen by pediatric nurses since birth. In this study, more than half of the investigated nurses are working with long-stay children. Their knowledge and attitudes could be changed by raising awareness and education and by detecting dental needs at an early stage which may result in reducing the number and frequency of medically compromised children who require dental treatment under General Anesthesia.

On average, 64% of surveyed pediatric nurses had acceptable dental knowledge. Rabiei, et al. (2014) stated that primary care nurses had a low level of dental knowledge, especially in the pediatric dentistry domain [10]. Khanagar, et al. (2020) reported that pediatric nurses' have a concerning



level of knowledge regarding oral health care and should be encouraged to promote oral health to their patients [11]. The present study showed a great lack of knowledge in some areas of oral health care among pediatric nurses working with hospitalized children. More than 80% of surveyed nurses did not know at what age a child can likely brush his/her own teeth. Pediatric nurses should know that child could brush his/her teeth alone at 7 - 8 years, not at 3 or 5 years of age as most of the nurses answered. This is very important information as most of the admitted children in Saudi Arabia are preschoolers or toddlers who need assistance in maintaining good oral hygiene during hospitalization [12,13].

In this study, the majority of nurses know that numerous medical conditions impact oral health, making children more susceptible to poor oral health outcomes. In addition, more than 90% of the surveyed nurses know that some medications can cause mouth dryness or dental caries compared to 86% of nurses who knew that certain medications could affect the oral health of children in Khanagar, et al.'s study [11]. A much lower percentage was reported in Rabiei, et al.'s study who found that 20% - 40% of participants were aware of the drug's effects on dental health [10]. This difference might be related to that our participants are working in direct contact with the children for long periods in which they can notice the effect of the drugs and medical conditions on oral health. However, most of them don't know that Xylitol is teeth-friendly which reflects the lack of dental knowledge among participated nurses and the shortage in updating themselves.

About 43% of participants know that bacteria that cause dental caries can transmit from the mother to the child. Ahmed, et al. (2018) stated that only 11% of the nurses were aware that dental caries can be transmitted from the mother to the child [14]. Similarly, Khanagar, et al. (2020) showed that only 20% of the participants were aware of the risk of transmission of dental caries from mother to child [11]. However, Rabiei, et al. (2014) stated that 73% know that [10].

Rabiei, et al. (2014) reported that 24% of the nurses knew the correct time of tooth eruption [10], while Khanagar, et al. (2020) reported 60% [11]. However, 85% of the participants in this study knew that the correct time of tooth eruption is between the sixth and eighth months of a child's life.

In the current study, about 69% of our participants know that children should visit the dentist for the first time at 1 year of age. According to Rabiei, et al. (2014), 49% of nurses believed that the first dental visit should be after the eruption of the first primary tooth [10]. Ahmed, et al. (2018) stated that 38% of the participants were not aware that a child should be seen by a dentist after the eruption of the first tooth [14]. In Khanagar, et al.'s study, almost half of the participants, 50%, knew when a child should first be seen by a dentist [11].

About 55% of the nurses know that bottling or

breastfeeding can cause dental caries. Ahmed, et al. (2018) revealed that 70% of nurses were aware that sleeping immediately after giving milk or juice to the child increases the risk of dental caries [14]. Similarly, Khanagar, et al. (2020) reported that 73% showed the same response [11].

Fluoride is used to protect the teeth, this information was known by 64.3% of our participants which was similar to Ahmed's participants (66.5%) who believed that the use of fluoridated toothpaste for children can prevent caries [14], however, Khanagar, et al. (2020) reported that 71% of the nurses know that [11].

The reason behind the differences between the studies might be related to the differences in the level of basic dental knowledge during under-graduation educational programs and continuous learning since qualifying. Also, it might be due to a lack of encouragement to update their knowledge regarding dental and general health. The shortage in training programs in the basic educational curriculum has a massive influence on the results.

Nurses monitor and care for ill pediatric patients in variously medical wards. As the results revealed gaps in dental knowledge, they need to be knowledgeable about oral health care to effectively deliver it. About 77% of the participants had received instructions about oral care during their training, however, 28% had not received any oral care instructions since qualification. Nevertheless, the majority of the participants were willing to receive and obtain more information and clinical hands-on training in oral examination and diagnosis of oral diseases of hospitalized children as more than half of them believed that oral health care delivered by nurses is not efficient. Khanagar, et al. (2020) reported that 77.5% of the respondents do not attend training programs regularly [11]. Parish, et al. (2014) stated that more than half of their participants had never attended an oral health continuing education course or training [15]. However, Ibrahim, et al. (2015) reported that 92% of their participants received training as a part of their basic nursing training and 81% of the nurses indicated that further training would be beneficial [16].

The results of this study showed a positive attitude among the majority of the surveyed pediatric nurses toward the provision of oral care for hospitalized children. However, more than half of them believed that oral health care delivered by nurses is not efficient. Because of that most participants expressed a will to update their knowledge and improve their skills regarding oral health. A similar positive attitude was reported among nurses working with children and adults in national and international hospitals [10,11,17-19].

In this study, about 90% of the nurses would like to implement preventive oral care in their daily work activity, however, Lee, et al. (2019) stated that most respondent



nurses considered that dental hygienists should provide oral health care for hospitalized patients [20].

The majority of hospitalized children did not present satisfactory oral hygiene. Caries and periodontal diseases are associated with oral health behaviors. Increased time length at the hospital could increase gingival inflammation and dental plaque accumulation [21]. Pediatric nurses have the greatest contact with hospitalized children among health care providers, this gives a good opportunity to improve their role in oral health promotion [22]. Nurses should have the ability to incorporate oral health risk assessments, screenings, and oral health education into the infant, child, and adolescent health assessment. However, nurses may need to acquire further knowledge in this area to become competent and skilled in performing oral health assessments [23]. In addition, the adoption of an interprofessional education approach with a focus on providing effective oral health care needs to be integrated into regular nursing education, and practice. This may increase the interest and skills of nursing students in providing oral health care [24]. Introducing an Interprofessional education program for pediatric nurses can provide them with adequate knowledge, awareness, confidence, and attitude regarding oral health issues. It also can help them in changing behavior, prevention, and ongoing dental surveillance [25,26]. Although the study sample reflects the knowledge and attitudes of pediatric nurses working only in Riyadh city regarding oral care of hospitalized children, the results of this study present an important vision for Saudi health services developers regarding the views and understandings of medical nursing staff considering the delivery of oral care for hospitalized patients in Saudi Arabia. The aforementioned points should be clearly addressed and a future national survey is highly recommended.

Conclusion

Pediatric nurses working in Riyadh hospitals had limited oral health knowledge, however, they showed good awareness and a positive attitude toward promoting oral health care to hospitalized children. Data suggests a need for education programs to build more knowledge and skills related to oral assessment and approaches to oral care of hospitalized children.

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