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Research Article

KNOWLEDGE, ATTITUDE AND PRACTICE OF ORAL HYGIENE AMONG NURSING STAFF IN PEDIATRIC CARE HOSPITALS IN RIYADH, SAUDI ARABIA

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Abstract:

Pediatric nurses have the greatest contact with mothers and children among health care providers, so the aim of this study was to assess the knowledge, attitude, and practice of oral hygiene among the nursing staff in Riyadh hospitals, Saudi Arabia. A cross-sectional study was conducted among 350 randomly selected pediatric nurses. The data was collected using a self-administered structured questionnaire under four main sections: demographic details, knowledge, attitude, and practice. Chi-square test was used, and data was entered and analyzed using SPSS Version 23 with a statistically significant value of $P < 0.05$. Results have showed that 58.7% of the participants did not have oral health care courses in their nursing curriculum, and only 21.4% had attended oral health training programs. The majority of the participants were aware of the importance of good oral health for the child's overall health. 60% knew the correct timing of teeth eruption, 20% were aware of the risk of transmitting dental caries. Almost all nurses consider oral health care as a part of nursing care and oral diseases are preventable. However, 21% consider cleaning the patient's mouth an unpleasant task, and 33.3% consider oral health care delivered by nurses is insufficient. The majority examine the oral cavity and perform oral hygiene practices. Only 22.2% reported that they had an oral health training program. 80% emphasize on regular dental checkups, demonstrate oral hygiene techniques, document oral findings, and refer patients to the dentists. Pediatric nurses' have a concerning level of knowledge regarding oral health care and should be encouraged to promote oral health to their patients.

Keywords: Pediatric Nurses; Oral Health Behavior; Nursing staff; Oral Hygiene.

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1. INTRODUCTION:

Oral health and oral hygiene are integral parts of general health and hygiene practices throughout all stages of a child's development, pediatric patients diagnosed with systemic diseases are at increased risk for developing dental caries and having poor oral health compared to healthy individuals [1]. On the other hand, poor oral health can compromise the general health of the patient; thus, if oral complications are left untreated, the overall risk of general health conditions is increased [2]. Dental caries is the most common chronic disease affecting the pediatric population, which raises a serious problem [3-4]. The majority of our pediatric population frequently visit pediatric health care, but not dental care in their early life [5-6]. Pediatric nurses have the greatest contact with mothers and children among health care providers, this gives a good opportunity to improve their role in oral health promotion [7-8]. Therefore, pediatric nurses are the principal healthcare providers. Pediatric nurses must have the knowledge about the importance of oral health, oral hygiene practices, and early intervention; thus, providing oral care is one of their duties [9]. Nurses have a significant role in encouraging oral hygiene practices and even referring the patients to dental clinics whenever required. Furthermore, communication between the primary care nurses and dental team members is important to keep oral health optimal [10]. Providing oral care for patients is focused on assessing the oral health of the patients, educating the patients, and providing primary oral care to maintain oral health [9]. The present study was taken up with a null hypothesis stating that states Pediatric nurses do not have adequate knowledge regarding oral health care; therefore, The aim of this study was to assess the knowledge, attitude, and practice of oral hygiene among the nursing staff in the pediatric care hospitals in Riyadh, Saudi Arabia.

2. MATERIALS AND METHODS:**2.1. Study Design**

A cross-sectional analytical study was conducted to assess the knowledge, attitude, and practice of

pediatric nurses in Riyadh, Saudi Arabia. The study was scheduled for a period of three months, October to

December 2019. Before the start of the study, ethical clearance was obtained from the Institutional Review Board (IRB-NCBE Reg. No: H-01-R-005). The target population comprised of all pediatric nurses working in the pediatric health care centers of Riyadh, Saudi Arabia. Based on the previous literature, the sample size was estimated with the power of 80% and 95% confidence interval for a prevalence of 50%; thus, the required sample size was 350 [11].

2.2. Participants and Settings

Riyadh has thirty tertiary hospitals in which pediatric departments with varying numbers of pediatric nursing staff in each unit. Out of this, nine hospitals were randomly selected for the study. Convenience sampling technique was used for selecting the subjects, taking into consideration the selection criteria to meet the sample size of 350. The participants were informed about the study and that participation is voluntary. Written informed consent was obtained from the willing participants. The participants included in the study comprised of pediatric nurses in contact with pediatric patients. Non-pediatric nurses, pediatric nurses not in contact with pediatric patients, pediatric nurses not willing to participate, and those who no longer in practice were excluded.

2.3. Questionnaire Survey

The data was collected using a self-administered structured questionnaire. The questionnaire was designed after referring to similar studies reported in the literature [12-14]. The questionnaire was divided into four main sections. The first section comprised of questions related to demographic details and the other sections were related to knowledge, attitude, and practice (questions number 1-7). The second section comprised of 8 questions (questions number 8-15) regarding general knowledge and information about oral health care. The third section comprised of 9 questions (questions number 16-24) enquired about the nurses' attitude toward the oral health care of their

pediatric patients. Last section comprised of 7 questions (questions number 25-31) related to the nurses' oral hygiene practices towards pediatric patients. A pilot study was conducted to check the feasibility and reliability of the questionnaire.

2.4. Validity and Reliability of Instrument

Validity and reliability of the questionnaire content were evaluated by a panel of experts made up of College of Dentistry faculty members, King Saud bin Abdulaziz University for Health Sciences (KSAU-HS). The purpose here was to highlight the questions that had a higher degree of agreement among the evaluators; additionally, Aiken's test was used to quantify the concordance between the evaluators for each question with a value higher than 0.86 obtained for the questions included in this questionnaire [15]. A pilot study was done to assess the feasibility of the questionnaire, among 5% of the study sample, and their responses were included in the final data analysis. All 29 questions that were used in the pilot study were used in the final version of the questionnaire.

2.5. Data Collection and Analysis

The data collected was entered and analyzed using SPSS Version 23 (IBM Corporation, Armonk, NY, USA). The data were summarized as proportions, since all the variables were categorical variables, Chi-square test was used to compare categorical variables and comparison within the group (age, gender, work experience, job title, degree of education, having oral health care course in the nursing curriculum and attending oral health training program after

graduation). All tests were two-sided with a statistically significant value of $P \leq 0.05$.

3. RESULTS:

3.1. Demographic Details Results

Data was collected from 350 willing participants. Age of the participants varied, 41.9% (147) of them were in the age group of 20-30 years, 44.2% (155) of them were in the age group of 31-40 years, while 11.1% (39) of them were in the age group of 41-50 years, and only 2.8% (10) of them were more than 51 years of age. The majority of the participants 98.3% (345) were females and only 1.7% (6) were males. Regarding their work experience, the majority 61% (213) of the participants had a work experience of 1-4 years, and 21.7% (76) of them had a work experience of 5-10 years, while 10.5% (36) had a work experience of 11-15 years, 5.1% (18) of them had a work experience of 16-20 years, and only 1.7% (6) had a work experience of more than 20 years. Among the participants, 87.7% (308) were registered nurses, 4% (14) were nurse practitioners, and 2.3% (8) comprised of licensed practice nurses while 2% (7) were ICU nurses. Regarding their degree of education, 23.6% (83) of the nurses had a diploma and 73.2% (257) had a bachelorette degree while 1.4% (5) had a master's degree or general nursing midwifery degree. 41.3% (145) of the participants reported that they have taken up oral health care courses in their nursing curriculum whereas 58.7% (206) of the participants did not have oral health care courses in their nursing curriculum. Only (21.4%) (75) of them had attended oral health training programs after graduation (Table A1).

Table A1. Demographic Details Results

	Categories	Number	Percent
Age Category	20-30 years old	147	41.9%
	31-40 years old	154	44.2%
	41-50 years old	39	11.1%
	+50 years old	10	2.8%
Gender	Female	344	98.3%
	Male	6	1.7%
Work Experience	1-4 Years	212	60.7%
	5-10 Years	76	21.7%
	11-15 Years	37	10.8%
	16-20 Years	18	5.1%
	+20 Years	6	1.7%
Job Title	Registered Nurse	307	87.7%
	Nurse Practitioner	14	4.0%
	Licensed Practice Nurse	8	2.3%
	ICU Nurse	7	2.0%
	Other	14	4.0%
Degree Of Education	Diploma	83	23.6%
	Bachelorette	256	73.2%
	Master	5	1.4%
	General Nursing Midwifery	6	1.7%

3.2. Nurses Knowledge Results

Data collected from the nurses regarding their knowledge showed that the majority of the participants 95% (331) were aware of the importance of good oral health for the child's overall health. The results also showed that 74% (259) of the participants believed that cleaning the child's oral cavity should start before the eruption of the first primary tooth. This was significantly affected by whether the participants have taken up oral health care courses in their nursing curriculum ($P=0.001$) (Table-2). Also, 60% (211) of the participants believed that the 1st tooth erupts between the 6th and 8th month of a child's life; however, 22% (78) of them believed that it will erupt before the 5th month. This response was significantly affected by attending oral health care training

programs after graduation ($P=0.001$) (Table-2). Half of the participants 49% (173) believed that the child's first dental visit should be after the eruption of the 1st primary tooth. 80% (280) of the participants were unaware of the risk of transmitting dental caries from mother to child. However, 73% (256) of the participants agreed that sleeping immediately after giving milk or juice to the child increases the risk of dental caries, which was strongly associated with their work experience ($P=0.040$) (Table-2). 71% (248) of the participants believed that the use of fluoridated toothpaste for children can prevent caries. Moreover, the majority of the participants 86% (301) agreed that certain medications can affect the oral health of children (Table A2) (Figure A1).

		When cleaning teeth should begin			Total	P Value
		Before eruption 1 st primary tooth	After eruption 1 st permanent tooth	After all teeth erupt		
Attended a training related to oral health after graduation	Yes	119	15	11	145	.001
	No	139	54	12	206	
	Total	258	69	23	350	
		What age 1 st tooth erupts			Total	P Value
		4-5 Months	6-8 Months	9-12 Months		
Attended a training related to oral health after graduation	Yes	28	36	10	75	.001
	No	50	174	51	276	
	Total	78	210	61	350	
		behavior increasing tooth decay			Total	P Value
		Thumb sucking	Sleeping with a pacifier	Sleeping immediately after milk or juice		
Work experience (years)	1-4	35	22	155	212	.040
	5-10	10	4	62	76	
	11-15	6	9	23	37	
	16-20	2	2	14	18	
	+20	1	2	3	6	
	Total	54	39	257	350	

3.3. Nurses Attitude Results

The majority of the nurses 96.5% (338) consider oral health care as a part of nursing care. Also, 96% (336) of them think that nurses play an important role in the prevention of oral diseases. The majority of the nurses 98.3% (345) think that oral diseases can be prevented. 96% (337) of the nurses think that educating parents is important in the prevention of oral diseases. Moreover, 93.1% (326) of the nurses consider educating parents as a part of the nurses' role which was significantly affected by the nurses' work experience ($P=0.001$). 83.2% (292) of the nurses think that milk teeth require care. Also, 71.9% (251) of nurses think they should attend more oral health care training programs. This response was significantly affected by the nurses' work experience ($P=0.047$), whether the nurses have taken up oral health care courses in their nursing curriculum ($P=0.003$) and by attending oral health care training programs after graduation ($P=0.048$). Only, 21% (73) of the nurses consider cleaning the patient's mouth as an unpleasant task. Also, 33.3% (116) of them consider oral health care delivered by nurses is not efficient (Table A3) (Figure A2).

Figure A1. Knowledge Results

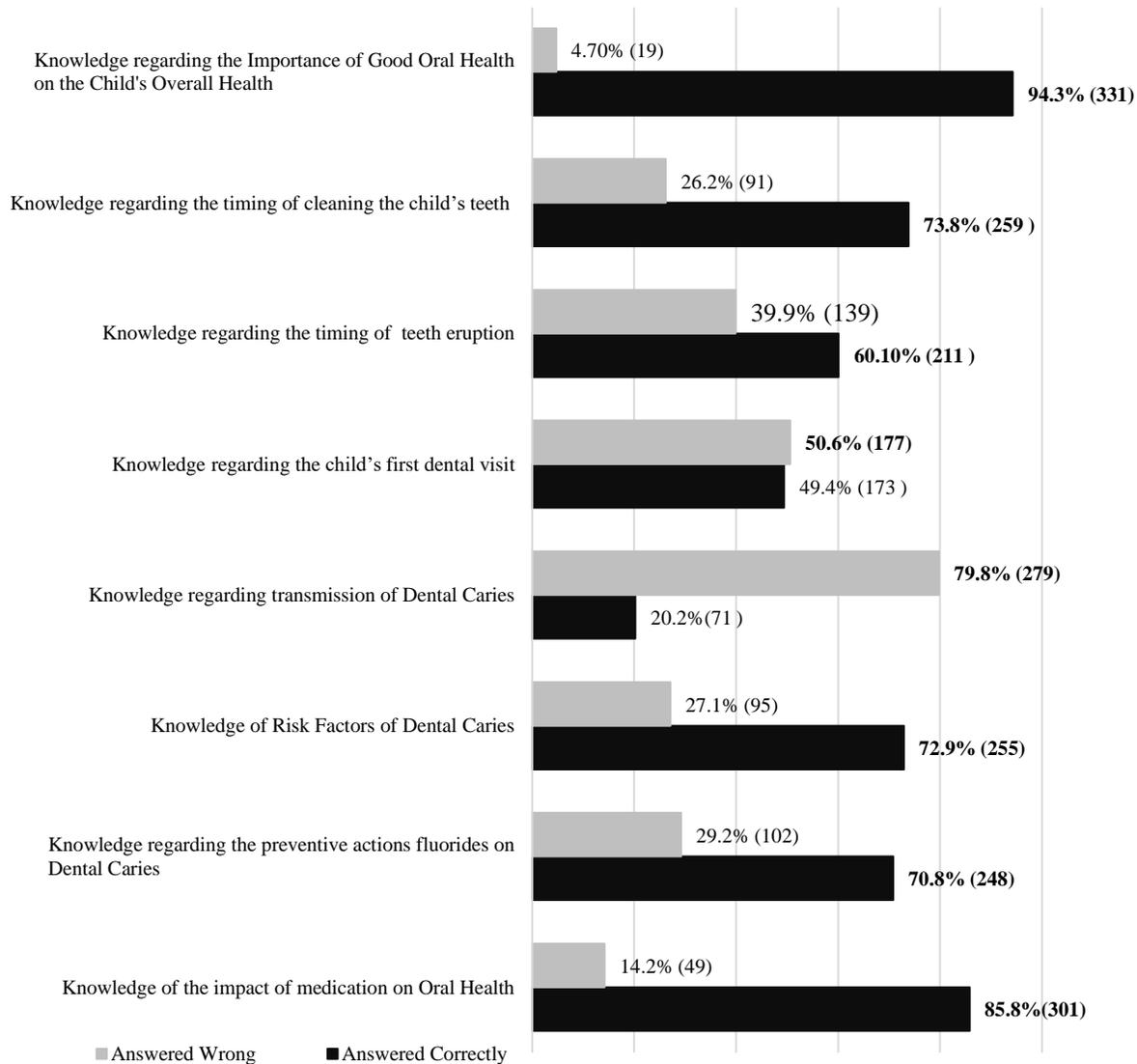
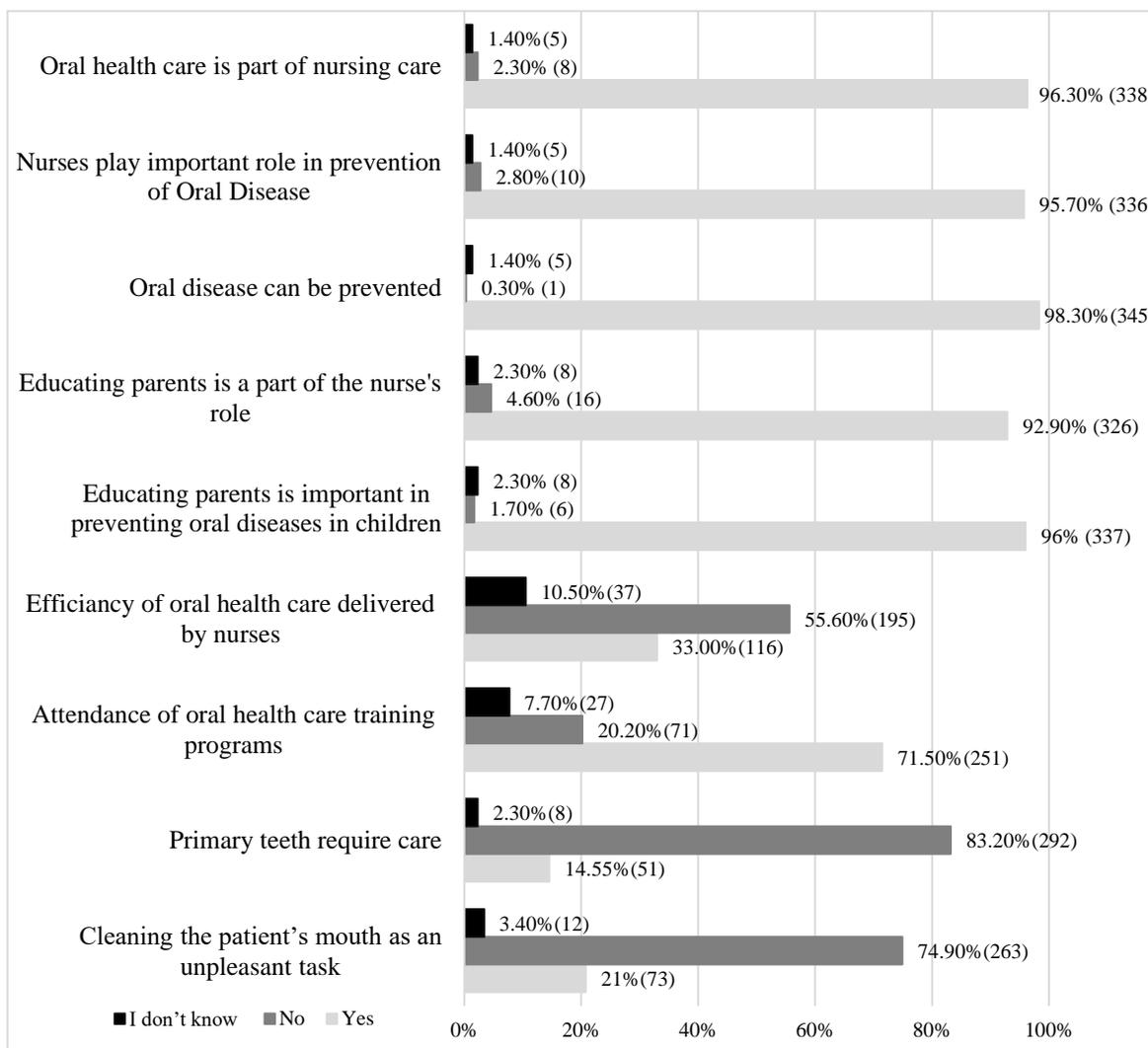


Table A3: Attitude Results						
Work experience (years)		Educating Parents is Part of The Nurses' Role			Total	P Value
		Yes	No	I don't have knowledge		
	1-4	199	9	5	213	.001
	5-10	69	6	1	76	
	11-15	36	1	0	37	
	16-20	18	0	0	18	
	+20	4	0	2	6	
Total	327	16	8	350		
Work experience (years)		Nurses Should Attend Training Programs			Total	P Value
		Yes	No	I don't have knowledge		
	1-4	159	35	18	212	0.047
	5-10	53	18	5	76	
	11-15	23	13	2	38	
	16-20	15	3	0	18	
	+20	2	2	2	6	
Total	252	71	27	350		
Attended a course related to oral health		Nurses Should Attend Training Programs			Total	P Value
		Yes	No	I don't have knowledge		
	Yes	117	22	5	144	.003
	No	135	49	22	206	
Total	252	71	27	350		
Attended a training related to oral health after graduation		Nurses Should Attend Training Programs			Total	P Value
		Yes	No	I don't have knowledge		
	Yes	60	14	1	75	.048
	No	192	57	26	275	
Total	252	71	27	350		

Figure A2. Attitude Results

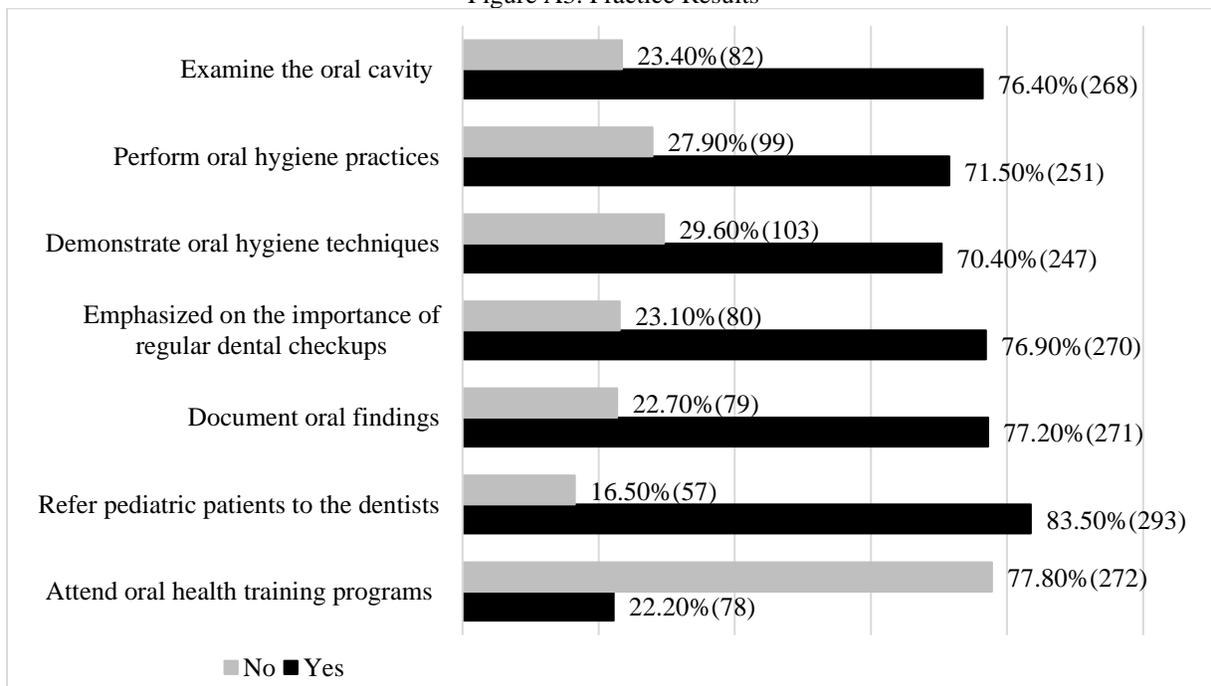


3.4. Nurses Practice Results

The majority of the participants 76.6% (268) reported that they examine the oral cavity of their patients, and 71.7% (251) of them perform oral hygiene practices which were significantly affected by whether they have taken up oral health care courses in their nursing curriculum ($P=0.009$). Nurses were questioned about their attendance to any oral health training programs and 77.5% (272) of the respondents reported that they do not attend training programs regularly. Moreover, 77.1% (270) of the participants emphasized the importance of regular dental check-up which was strongly associated with attending oral health care training programs after graduation ($P=0.042$). The majority of the nurses 70.6% (247) demonstrate oral hygiene techniques. Also, 77.4% (271) of the respondents reported that they document oral findings. 83% (293) of the nurses reported that they refer pediatric patients to the dentist (Table A4) (Figure A3).

Table A4: Practice Results					
Attended a course related to oral health		Perform oral hygiene practice		Total	P Value
		Yes	No		
Attended a course related to oral health	Yes	117	27	144	.009
	No	134	72	206	
	Total	251	99	350	
Attended a course related to oral health		Attend training programs regularly		Total	P Value
		Yes	No		
Attended a course related to oral health	Yes	44	101	145	.007
	No	34	171	205	
	Total	78	272	350	

Figure A3. Practice Results



4

. DISCUSSION:

4.1. Knowledge of Nurses about Oral Hygiene

Different studies aimed to assess nurses' knowledge, attitude, and/or practice were published in different countries. A study conducted by Rabiei *et al.*, revealed a high level of knowledge among pediatric nurses [12]. Rabiei's participants showed 60% - 79% of nurses knew the relationship between periodontal and systemic diseases. Similar results were found when compared with the current study, which showed that 94% (331) of the participants were aware of the importance of good oral health for the child's overall health [12]. Rabiei *et al.*, reported 24% of the nurses knew the correct time of tooth eruption. 60% (211) 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 [12]. The lack of training programs in the basic educational curriculum has a huge impact on the results. According to Rabiei *et al.*, 49% (173) believed that the first dental visit should be after the eruption of the first primary tooth [12]. However, 37% (129) agreed that the first visit to the dentist should be after the eruption of all primary teeth which were similar to the results reported by Ahmed *et al* [13]. Ahmed has 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 [13]. In our study, almost half of the participants, 50% (177),

knew when should a child first be seen by a dentist. This variation in answers due to differences in the education level and quality of training program. Ahmed et al., stated that 89% of the nurses were not aware that dental caries can be transmitted from the mother to child [13]. These results were contrary to the results reported by Rabiei et al., which stated that only 27% did not know that [12]. The present study shows 80% (280) of the participants were unaware of the risk of transmission of dental caries from mother to child, similar to Ahmed et al.'s results [13]. The reason why these participants did not know the answer is due to a lack of basic 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. Ahmed et al, revealed in their study that 70% (119) were aware that sleeping immediately after giving milk or juice to the child increases the risk of dental caries [13]. Similarly, in the present study, 73% (256) showed the same response. Almost the same results were reported in both studies, participants who receive dental training or educational courses after qualifying which has a positive effect on their knowledge. 66.5% (113) of Ahmed's participants believed that the use of fluoridated toothpaste for children can prevent caries compared to 71% (248) of the nurses in our study [13]. 20% - 40% of participants in Rabiei et al.,'s study were aware of the drugs' effects on dental health [12]. Unlike their study, the majority of our participants, 86% (301), knew that certain medications can affect the oral health of children.

4.2. Attitude of Nurses about Oral Hygiene

In Rodrigues et al., have mentioned in their study that 100% (45) of the nurses believed that oral health care is part of their nursing care [14]. Also, Ibrahim's study revealed that the majority, 97.4%, of ICU nurses perceived oral care as a high nursing priority [16]. In our study, a similar percentage of nurses consider oral health care as a part of nursing care 96.5% (338). Regarding the nurses' role in the prevention of oral diseases, Rabiei et al., reported 72% of the nurses believed that they could play an important role in preventing oral diseases [12]. In our study, 96% (336) think that nurses play an important role in the prevention of oral diseases. These findings highlight the need for adequate training and support for nurses working in pediatric care. Rabiei et al.,'s study showed 94% of the nurses believe that oral diseases can be prevented through routine dental visits [12]. In our study, 98.3% (345) of the nurses think that oral diseases can be prevented. A study conducted by Ahmed et al., in India showed that 100% of the nurses

consider that educating parents is important in preventing caries in children [13]. In our study, the majority of nurses 96% think that educating parents is important in the prevention of oral diseases. In Tahrán, Rabiei et al., reported that 51% of nurses consider the delivery of oral health care by nurses is inefficient. however, 33.3% (116) of nurses consider oral health care delivered by nurses is not efficient [12]. In a study conducted in Singapore found that 65.8% of nurses felt that it was essential to attend training on proper oral care [17]. In Riyadh, Saudi Arabia, a study showed that 44% of nurses have the desire to undergo training on oral care [18]. In the current study, the majority of nurses, 71.9% (251), think they should attend more oral health care training programs. This shows that nurses have a positive attitude toward learning and updating their knowledge about oral health. Ahmed et al.,'s study in India showed that 81% of the nurses believe that milk tooth does not need care as it will be shed [13]. On the other hand, our results showed that 83.2% of nurses think that milk teeth require care. Response reported by Ullman, & Letton in Australia showed 22% of the nurses consider cleaning the patient's mouth an unpleasant task [19]. In Singapore, in 2012, Chan et al., reported that only 14.6% of nurses consider cleaning the patient's mouth as an unpleasant task [17]; similarly, in Ethiopia, a study conducted by Andargie, & Kassahun shows that 30.1% of nurses find it an unpleasant task [20]. Similarly, our results showed 21% (73) of nurses consider cleaning the patient's mouth as an unpleasant task. These results show that there is a negative attitude toward cleaning the patient's oral cavity.

4.3. Practice of Nurses about Oral Hygiene

In North Carolina, dela Cruz et al, reported that only 1% did not examine the child for dental diseases [21]. In Texas, Tewogbade et al., reported that 2% of the participants did not examine the oral cavity [10]. However, in our study, 23.4% of the participants did not examine the oral cavity of their patients. Ramroop et al., reported that 12% of the participants don't perform oral health practice for their patients whereas more than 85% of the participants perform oral health practice for their patients [22]. In Khartoum, Ibrahim et al., reported that only 20% of nurses were found to apply good practice [16]. In our study, 71.7% (251) of the participants perform oral hygiene practices on their patients. This shows that there may be a lack of knowledge and training of pediatric nurses. Although the majority of nurses perform oral hygiene practice to their patients, not all patients are subjected to oral care. This may be due to the lack of clear published policies in some hospitals about oral care of pediatric patients. For example, Glenny et al., found that 13 out of 22

(68.4%) children's cancer centers in the UK had oral assessment guidelines and protocols [23]. The results of this investigation indicate a problem with the level of current practice guidelines and a lack of continuous training programs. In Texas, Tewogbade et al., reported that 27 of the nurses demonstrate oral hygiene instructions to their patients, respectively [10]. In the United Kingdom, Glennya et al., reported that in 20 centers 90.9% of the nurses demonstrate oral care to families in the first instance [23]. The majority of participants, 70.6% (247), demonstrate oral hygiene techniques to their patients. However, there was little variation in the advice given to patients and their parents on basic oral hygiene. If nurses are to play a major role in oral care, continued education, and preferably collaboration with dentists to ensure optimal oral hygiene for pediatric patients [23]. In the United Kingdom, Glennya et al., interviewed nurses in all 22 children's cancer centers [23]. Results showed that 19 of the centers advise patients to visit dental clinics linked to the hospital for regular checkups. Although most nurses had a positive response, emphasis on regular dental checkups and training programs could result in placing more importance on preventive efforts that can help in the improvement of the oral health of their patients. In our study, the majority of the participants 77.1% (270) emphasized the importance of regular dental checkups. Mukhtar et al., reported that 69.8 % (155) of the nurses positively responded that they do document oral findings [24]. Similarly, 77.4% (271) of the respondents in our study reported that they document oral findings. In North Carolina, dela Cruz et al., only 6% of the nurses did not refer pediatric patients to the dentists [21]. In Texas, Tewogbade et al., reported that 12 nurses from pediatric cancer and stem cell transplant ward had never made a dental referral [10]. In the current study, 16% of the nurses reported that they do not refer pediatric patients to the dentists. Although a high number of referrals were reported, a substantial number of the participants rarely refer to their pediatric patients. Therefore, educating nurses in oral health promotion and disease prevention should be placed as a priority. As encouraged by the American Academy of Pediatric Dentistry and American Academy of Pediatrics that non-dental health care providers use caries risk assessment in the care of children to be actively involved in recognizing and referring high-risk children [25]. Parish et al., stated that more than half 55.1% of their participants had never attended an oral health continuing education course or training [26]. In Khartoum, Ibrahim et al., reported that 92% only received their training as a part of their basic nursing training and 81% of the nurses indicated that further training would be beneficial [16]. In the current

study, similar results were found as 77.5% (272) of the respondents reported that they do not attend training programs regularly. As a result, the participants' response shows a lack of effective training, which indicates the need to equip nurses with continuous education and training on oral care for their patients. As the majority of the participants indicated a deficiency in their provision of oral care and training. Further researches need to be taken to improve oral care delivery for pediatric patients by providing training and recommendations for pediatric nurses [16].

5. CONCLUSIONS:

In the present study, the nurses' knowledge of oral health was found to be inadequate which can be improved by incorporating oral health education programs in the nursing curriculum and encouraging nurses to attend oral health training programs on regular basis. Moreover, nurses show a positive attitude towards oral health care and have the desire to learn and update their knowledge. However, the delivery of oral health care by nurses is not sufficient which can be enhanced by implementing strict oral assessment guidelines and protocols for their patients.

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