

Knowledge and Awareness of Healthcare Professionals about Infant Oral Health

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Abstract

Original Research Article

Introduction: The strategy of utilizing primary medical care to promote oral health is particularly necessary and especially through infant oral health measures (IOH). Pediatricians and family physicians were knowledgeable about some aspects of ECC and infant oral health but were uncertainly identifying dental caries and the early signs of ECC. The majority of physicians reported that they play an important role and are involved in promoting the oral health of children in their practices. **Aim:** This cross-sectional study was designed to assess baseline knowledge of infant oral health IOH among healthcare professionals. **Design:** An online self-reported cross-sectional survey was designed to assess awareness about IOH. A total number of 449 healthcare professionals (dentists, physicians, nurses and dental assistances), working in facilities dealing with infant health responded to the survey in various countries. The survey was consisting of 12 questions regarding IOH. A score of 70% or more was considered as a “pass” score based. **Results:** Descriptive and analytic statistics were performed for all groups and subgroups based on their responses which reflect their awareness of IOH. Around 53% of health professionals (n= 242) were able to achieve pass scores, while 47% of health professionals (n=207) did not achieve it. Regarding demographic and occupational characteristics there was a significant difference in pass rate about age (p< 0.001) being lower in the age group below 30 years. We also found a significant difference in pass rate in relation to gender and type of job (p< 0.05). However, there was no significant difference in relation to the duration of the experience (p> 0.05). **Conclusion:** There is a need for continuous education and training programs on updated oral health measures for all healthcare providers. This study calls for further research to evaluate the role of various factors involved in IOH care and to effectively educate all healthcare providers.

Keywords: Knowledge, Awareness, healthcare professionals, Infant, oral health.

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INTRODUCTION

Infant oral health (IOH) depends on education on preventive measures and dental care which must be built to enhance the opportunity for lifetime-free oral diseases [1-5]. Infant oral health is the foundation upon which preventive education and dental care must be built to enhance the opportunity for a lifetime, free of preventable oral diseases. Mothers are decision-makers and play an important role in achieving the best oral health outcomes for their young children. A young child's dental environment is complex because their mothers' and/or caregivers' dental knowledge, attitudes, beliefs and practices affect the child's oral condition [6, 7]. Very young children are dependent on their mothers to attend to their oral hygiene and feed them. Inappropriate bottle use patterns, such as the addition of sweeteners to the liquid and prolonged exposure to sugary liquids at bedtime, and later age at weaning have been linked to early childhood caries [8]. Prevention is

the primary focus of infant oral health care and prevention of dental diseases should be initiated in infancy itself. For diseases that occur early in life such as early childhood caries (ECC) prevention of diseases and the promotion of healthy behavior among parents/caregivers must be given importance [9]. Preventive oral healthcare must be initiated in infancy because of the following reasons: Poor oral hygiene and improper infant feeding practices create an environment that promotes the colonization of cariogenic bacteria such as Streptococcus mutants in the infant's mouth. Thus, when a tooth erupts in an infant's mouth, it is in an undesirable oral environment that promotes demineralization. Risk factors such as improper feeding practices and poor oral hygiene that may lead to early childhood caries (ECC) may be identified at an early age and appropriate intervention may be planned. Undesirable consequences of poor dental health such as ECC may be avoided, and the infant may escape its complications such as dental pain and poor nutrition.

The psychological health of the child can be maintained as the unesthetic appearance of teeth negatively impacts the psychology of a child [10].

Infant oral health care is the foundation on which a lifetime of preventive education and dental care can be built to help acquire optimal oral health into childhood and adulthood [11]. The preventive oral health process among infants must begin early, i.e. the first year of infancy to ensure successful oral hygiene. The purpose of an infant oral health program, therefore, is to improve access to oral health care and to provide counseling and anticipatory guidance in oral hygiene for children aged 6 months to 5 years [12]. The first step of infant oral health care is the preventive oral health behavior of parents since they would influence their children's behavior in adapting to the preventive oral health practices as they grow along [13]. Parents are unlikely to solicit dental care of their own accord to their children without education, motivation, and help from physicians who see children at least 11 times for well-child visits through age three [14]. Preventive dental care should start early in infancy, during the first year of a child's life to ensure successful outcomes. Physicians are the first health professionals to come in contact with expectant parents and parents of infants [15]. Hence, integrating oral health disease prevention and promotion strategies into these healthcare professionals' practice would improve access to dental care, especially for the poor and minority children who suffer disproportionately from dental caries and who have limited access to dental care [16]. It is unclear to what degree these healthcare professionals are knowledgeable and has awareness about preventive dental care for IOH and at the same time to what level they impart preventive dental counseling as a part of well-child visits. Thereby, our study was designed to examine and assess the baseline knowledge and

opinions of medical and dental professionals on preventive dental care for IOH.

SUBJECTS & METHODS

An online self-reported cross-sectional survey was designed to assess infant awareness oral healthcare knowledge and awareness between dentists, physicians, dental assistants and nurses. All health professionals involved are working in facilities dealing with infant health. The survey was consisting of 12 questions based on the recommendations of according American Academy of Pediatric Dentistry (AAPD) [1]. A score of 70% or more was considered as a "pass" score based. The data of participants was kept anonymous and confidential. The survey was made available online in the period between 1st May and 31st December 2022.

Statistical Analysis

We aimed for a target sample size of at least 383 participants to ensure a confidence level of 95% and a margin of error within $\pm 5\%$ of the surveyed values [17]. We collected 466 responses to the survey including duplicate responses (n=12), and those who refused to enroll (n=5). We ended up with 449 valid responses. Validated data was tabulated, entered, and analyzed using Statistical Package for the Social Science (SPSS), version 21.0 (SPSS Inc. Chicago, IL, USA). Chi-square χ^2 or Fisher Exact test was used for the comparative analysis of categorical variables. $P \leq 0.05$ was statistically significant.

RESULTS:

Demographic Data

Following the consent to participate in this study, we started with an exploration of the demographic characteristics of our respondents. A total number of 449 health professionals work in facilities dealing with infants and children in the survey from various countries as shown in Figure 1.

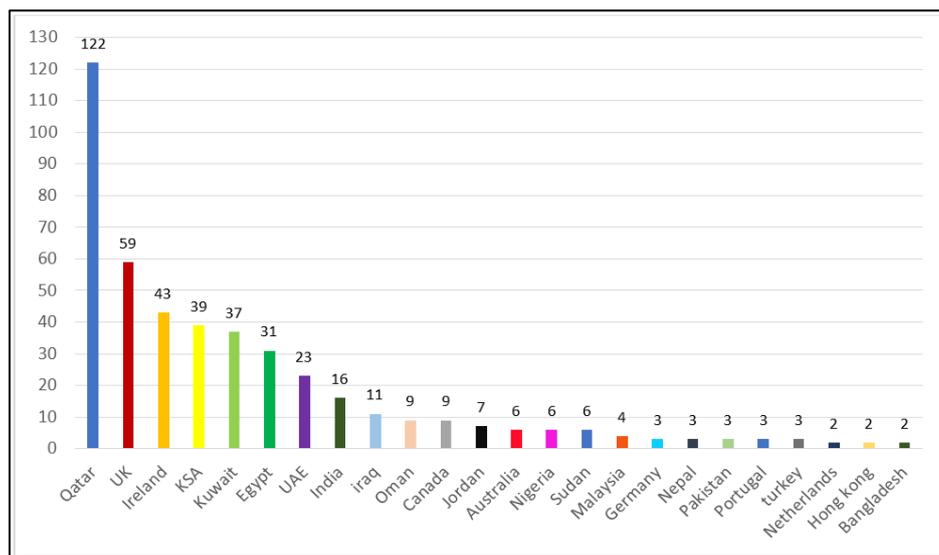


Fig. 1: Distribution and numbers of participants according to their country of residence

Demographic data shows participants belong to different age groups with about 61% (n=274) as males and 39% (n=175) as females. As for the age groups of participants, 5% of them were below 30 years old (n=25), more than half of the participants' age was

between 30-39 years old (n=238), participants with ages from 40-49 years old were less than one-third of total (n=133), and those with ages from 50 or above years old were 12% (n= 53) as in Fig 2.

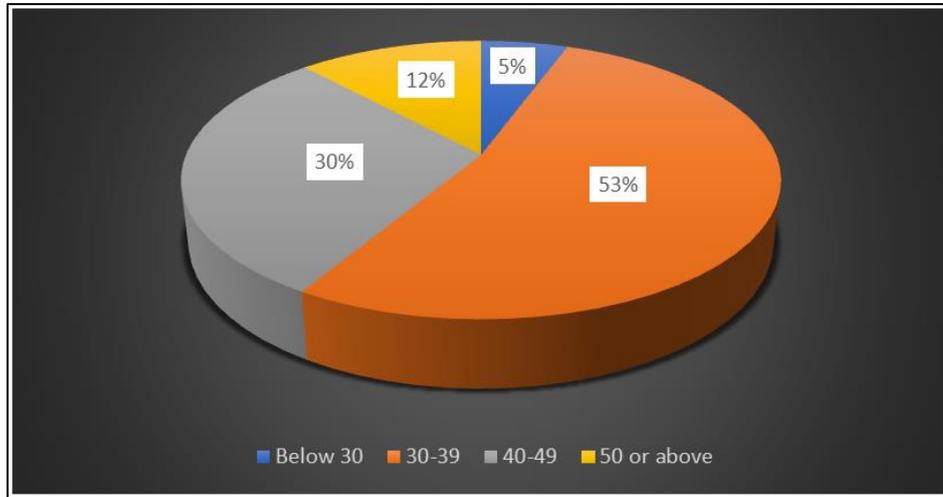


Fig. 2: Distribution of age group characteristics of HCW participating in the survey

Many participants with different workplace characteristics contributed to our survey including different occupations (physicians, dentists, nurses and

dental assistants), and different years of experience at work as shown in Fig 3.

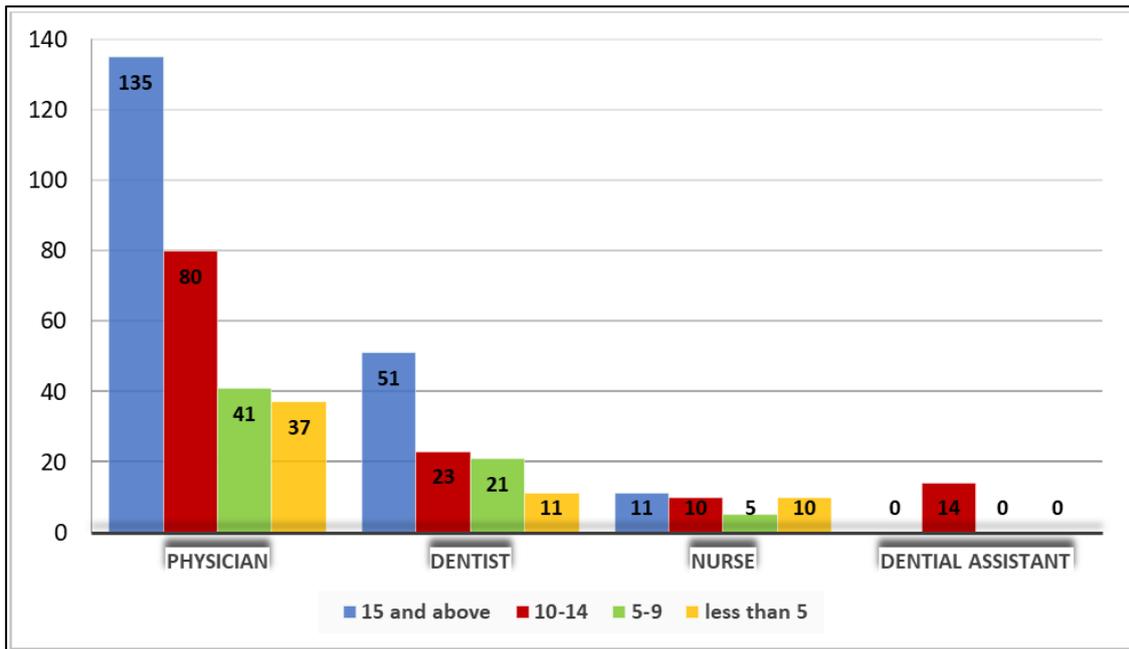


Fig. 3: Distribution of occupational characteristics of HCW participating according to work experience (year) in the survey

We set a total score of 70% as a passing score for our survey. We found that 53% of health professionals (n= 242) were able to achieve similar or

higher scores, while 47% of health professionals (n=207) did not achieve it as shown in Fig. 4.

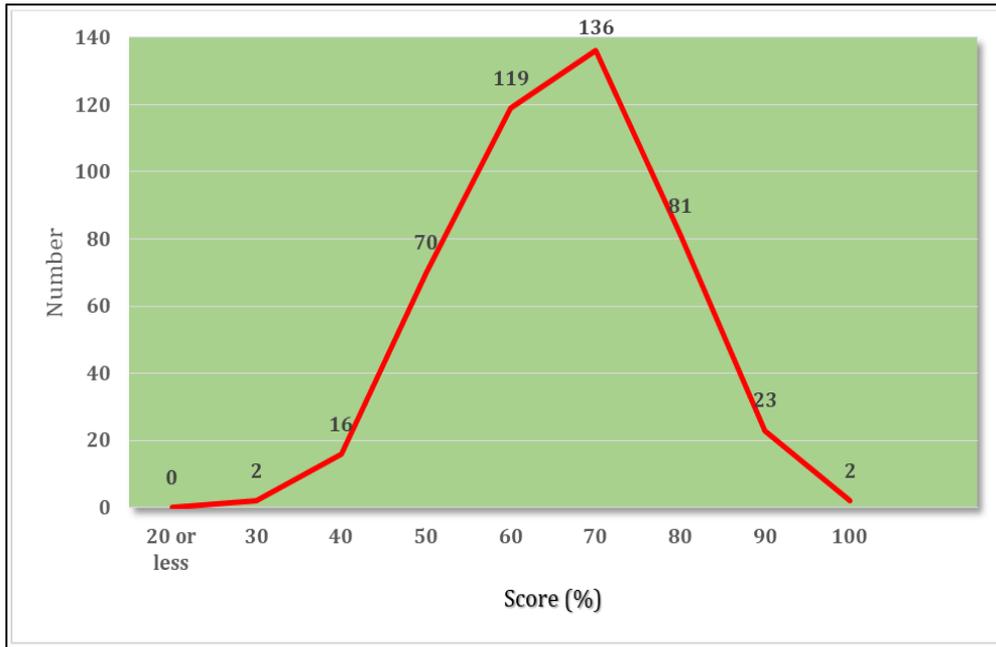


Fig. 4: Distribution of scores achieved by HCW participating in the survey; an expressed as a percentage of the total mark

Analysis of data related to pass or fail rates of the questionnaire about demographic and occupational characteristics revealed that there was a significant difference in pass rate about age ($p < 0.001$) being lower in the age group below 30 years. We also found a

significant difference in pass rate in relation to gender and job ($p < 0.05$). However, there was no significant difference in relation to the duration of the experience ($p > 0.05$) as shown in table 1.

Table 1: Distribution of pass/ fail rates in relation to demographic and occupational characteristics of participating in this survey

PARAMETER	PASS		FAIL		P
	N	%	N	%	
Age (year)					<0.001
Below 30	4	16	21	84	
30-39	142	59.7	96	40.3	
40-49	65	48.9	68	51.1	
50 and above	31	58.5	22	41.5	
Sex					0.045
Male	158	57.7	116	42.3	
Female	84	48	91	52	
Job					0.007(FISHER EXACT)
Medical doctors	213	55.9	168	44.1	
Medical assistance	29	42.6	39	57.8	
EXPERIENCE (YEARS)					0.457
Less than 5	29	50	29	50	
5-9	42	62.7	25	37.3	
10-14	67	52.8	60	47.2	
15 and above	104	52.8	93	47.2	

Table 2: Percentage of correct responses of healthcare providers in infant oral health knowledge survey

Questions	Dentist (%)	Physician (%)	Dental assistant (%)	Nurses (%)
1 Child's first dental visit – 6 months/at least by 12 months of age	65	54	29	31
2 Cleaning the child's mouth – before tooth eruption is essential	48	29	20	8
3 The right time to wean the child – 1 year	66	39	28	17
4 The right time to introduce the child to drinking from a cup – 1 year	51	48	39	16

5	S. mutans transmission from the mother/primary caretaker influences the child's dental health	83	51	33	31
6	Deciduous teeth need dental care as permanent teeth	96	74	69	54
7	Counseling parents on the importance of preventive oral health & performing oral health examinations during the child's well-care visit	98	74	71	69
8	Verbal delivery of information on the benefits and hazards of fluoride given during counseling	90	63	35	56
Exposure to the following in the night can affect a child's teeth					
9	Sweetened pacifier & sweetened liquid/fruit juice in a bottle	86	68	65	67
10	Breastfeeding after the eruption of the first milk teeth	93	72	56	25
11	Association between poor maternal oral health & preterm baby	56	23	37	27
10	ECC can develop as early as the first tooth erupts & can be visible by 10 months of child	60	55	12	5
11	More cariogenic sugar is sucrose & least cariogenic sugar is lactose	78	60	39	24
12	Sugar-free chewing gums decrease S. mutans transmission rate from mother to child	97	79	49	23

According to AAPD recommendations, the child should be seen within six months of the eruption of the first primary tooth and no later than 12 months of child age [1]. The rationale for the initial dental visit was at the developmental age of 3 years when children are more manageable and the treatment will be easily performed and more efficient. Early education of parents on oral hygiene and prevention of dental injuries and ECC [15], hence age one dental visit is highly recommended. However, very few physicians reported recommending a first visit to the dentist before one year of age [18]. More than half of physicians and dentists correctly responded to the question on the first dental visit. However, nurses and dental assistances achieved less than one-third of correct responses. This response was lesser than the results concluded by (Kumari NR. *et al.*, 2006) [19] and (Chung MH. *et al.*, 2006) [20] who reported 40% and 38.8% for dental and medical students, respectively. There was a severe shortage in nurses' and dental assistances' knowledge on most and least cariogenic sugar <49% and when is the right time to clean a child's gums <60% and their awareness regarding chewing gums and ECC was <12% in comparison to dentists and physicians. Increasing knowledge in these areas of oral prevention will facilitate the establishment of good feeding and oral hygiene practices that will enable to decrease in caries risk. Only less than half of dentists and doctors responded correctly that breast/bottle weaning of infants should be from by 12–14 months of age and introduction to semisolid foods can begin at six months. Iron- fortified cereals or pureed meats along with breast milk/infant formula are most preferable [21]. The nurses and dental assistants did not aware of the proper time for weaning >28%. Although this knowledge is considered an evidence base in the dental literature for a long time. On the other side, most doctors and dentists were aware that caries is a transmissible disease and that the child can acquire most of the strains of mutans streptococci from the mother [22, 23]. Our finding shows that most of the health professionals weren't well aware of the use of pacifiers, and sweetened liquid/fruit

juice in bottles at night was considered harmful. This result correlated with the findings from previous studies which showed that medical students. Verbal delivery of information regarding oral health, fluoride benefits and hazards were imparted by 63% of physicians and 90% of dentists in opposite to 35% of dental assistants and 56% of nurses reported that their educational curriculum incorporates a module on IOH. It was surprising to note most of the participants' responses were equally unaware regarding the association of poor maternal oral health to preterm/low birth weight baby and the right time to introduce the child to drink from the cup. Maternal bacterial transmission result in gingivitis/marginal periodontitis and produces an inflammatory effect on the placental membranes, thereby inducing preterm labor. Thus, the risk of prematurity can be reduced by periodontal therapy during pregnancy [24]. Children born prematurely are more susceptible to ECC due they have the high prevalence of enamel defects [25]. However, prolonged breastfeeding increases the risk of having dental caries. Preventive interventions for dental caries should be established as early as possible because breastfeeding is beneficial for children's health [26].

CONCLUSION

Our study reveals that there is a gap in knowledge of infant oral hygiene across all healthcare professions, especially among young, female and medical assistants. Even though nurses and dental assistance groups are not actively involved in patient management, there is a high possibility that they get in contact with patients at some point in the healthcare process and therefore they should be increased their knowledge.

RECOMMENDATION

Conducting periodic educational activity interventions for all healthcare professionals including clinical and non-clinical staff could be a helpful and safe tool to create proper awareness of infant oral

hygiene. This educational periodic activity should be targeted towards certain healthcare professional groups, namely young, female, and medical assistance categories. This study calls for further research to evaluate the role of various factors involved in IOH care and to effectively educate all healthcare providers.

CONFLICT OF INTEREST

The authors declare that they do not have any financial interest, arrangement, or affiliation with anyone in relation to this research that could be perceived as a real or apparent conflict of interest in the context of the subject of this study.

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