



To Evaluate the Level of Knowledge and Proficiency of Dental Practitioners in Diagnosing and Treating Dental Caries

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KEYWORDS

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ABSTRACT:

Aim: To evaluate the level of knowledge and proficiency of dental practitioners in diagnosing and treating dental caries.

Material and methods: Dental practitioners were involved in descriptive cross-sectional research. This study recruited a total of 200 participants, including undergraduate students attending clinics and dental interns. Before starting the questionnaire, all participants were given information about the study's goals and gave their agreement to participate. The study includes undergraduate students, dental interns, and postgraduates who are actively participating in clinics. Nevertheless, dental students who are not actively involved in clinical practice will not be eligible to participate in this research.

Results: A significant relationship was found between the knowledge of participants and their qualification level ($P=0.004$). However clinical experience showed a non-significant correlation. The qualification of participants had a significant effect on the practice level ($P=0.001$) while the clinical experience showed no significant effect.

Conclusion: According to the results of this research, which used a questionnaire, dental practitioners demonstrate a restricted degree of knowledge associated with their clinical experience. Incorporating organized approaches for recognizing and addressing cavities into the clinical dentistry curriculum might be advantageous for enhancing this expertise.

Introduction

Oral health has a crucial role in the general welfare of individuals and is particularly significant throughout infancy. The dental health of children has both immediate and long-term impacts, including connections to overall health and influences on quality of life. The World Health Organization (WHO) suggests many strategies to enhance oral health within the context of comprehensive healthcare. By

comprehending the significance of oral health, tackling the obstacles, and executing efficient techniques, we may motivate youngsters to cultivate favorable dental habits that will last throughout their lives and safeguard their general welfare [1,2]. Primary care practitioners, particularly doctors, have the potential to greatly enhance the dental health of their patients as part of their overall healthcare [3-6].



Dental caries is a prevalent chronic ailment in childhood, affecting around 25% of preschool-aged children in their primary teeth and at least 1 in 6 children aged 6 to 11 years in their permanent teeth. Dental caries is a gradual pathological condition that may be averted with timely intervention. However, if not given medical attention, it deteriorates progressively over time [2-4]. Untreated dental caries may have a substantial impact on a child's overall health and quality of life, resulting in issues such as discomfort, impaired ability to eat and chew, challenges with weight and development, diminished self-assurance, and difficulties in communicating [3-5].

In order to avoid tooth decay, it is crucial to maintain good oral hygiene, reduce plaque buildup, get information on oral health and nutrition, use fluoride or other substances that promote remineralization, and have frequent dental check-ups [7-9]. Parents should begin oral hygiene practices prior to the emergence of the first primary tooth by using gauze saturated in saline solution. It is advisable to gradually include a toothbrush and fluoride toothpaste into the routine after the teething process. Common recommendations suggest that parents should clean their children's teeth and supervise their brushing routine until the age of ten [10]. According to most dental organizations, it is recommended that a child's first dental appointment takes place within six months of the first main tooth appearing, and no later than 12 months of age. According to several authorities, it is recommended to schedule the first visit between the ages of 12 and 18 months. It is recommended to get dental check-ups every six months [11].

Globally, there is a growing focus on the involvement of non-dental staff in enhancing oral health, particularly in youngsters. The World Health Organization acknowledges the significance of oral health in interprofessional primary care practice [10]. Primary care clinicians, such as family physicians (general practitioners) and pediatricians, establish early communication with young children and their parents. From the moment of birth, they provide parents with reliable and authoritative information on how to avoid caries and other oral illnesses in babies and young children. Increased involvement of pediatricians and family doctors in oral health issues, especially for those who lack access to dental care, is essential for ensuring

that all patients get relevant oral health information and assistance [11-13].

Material and methods

Dental practitioners were involved in descriptive cross-sectional research. This study recruited a total of 200 participants, including undergraduate students attending clinics and dental interns. Before starting the questionnaire, all participants were given information about the study's goals and gave their agreement to participate.

The study includes undergraduate students, dental interns, and postgraduates who are actively participating in clinics. Nevertheless, dental students who are not actively involved in clinical practice will not be eligible to participate in this research.

Methodology

The data collection involved the creation of a self-administered online questionnaire, formulated through a comprehensive review of the literature and divided into three sections:

The initial section focused on gathering demographic information, including gender, years of clinical experience, and educational qualifications.

The subsequent section was designed to assess practitioners' knowledge about diagnosis, early detection of caries lesions, and caries risk assessment.

The final section explored the practices and attitudes of practitioners concerning the management of dental caries.

Data Analysis

All the collected data collecting was entered, tabulated, and analyzed using "Microsoft Office Excel". Descriptive data was presented in the form of frequency and percentages and for correlation, the chi-square test was used with SPSS version 25.0.

Results

A total of 200 dental practitioners participated in this study. Among them 112(56%) were female and 88(44%) were male. Maximum number of participants belonged to the group 20-30 years of age 84(42%), followed by 57(28.50%) participants which belonged to <20 age group, 38(19%) were >40 years of age and 21(10.50%) participants belonged to 30-40 years of age. Regarding the qualification of participants,



109(54.50%) were dental students, 38 (19%) were dental interns, 42(21%) participants were graduates and 11(5.50%) were postgraduates. 72(36%) participants had a clinical experience of less than 3 years, 32(16%) participants had a clinical experience of 3-5 years and 15(7.50%) participants had clinical experience of more than 5 years. (Table:2). The relationship between knowledge concerning clinical experience and qualification is presented in Table 3. A significant relationship was found between the knowledge of participants and their qualification level ($P=0.004$). However clinical experience showed a non-significant correlation. The practice assessment of participants about diagnosis and treatment of dental caries is presented in Table 4. The qualification of participants had a significant effect on the practice level ($P=0.001$) while the clinical experience showed no significant effect.

Table 1: Basic parameter of the participants

Parameter	Number	Percentage
Gender		
Female	112	56
Male	86	44
Age		
Below 20 years	57	28.50
20-30 years	84	42
30-40 years	21	10.50
Above 40 years	38	19

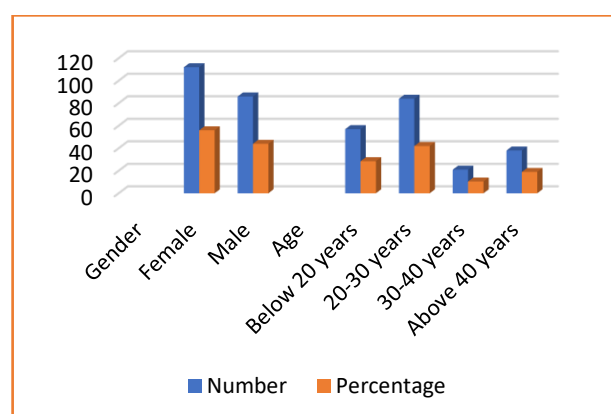


Figure 1: Basic parameter of the participants

Table 2: Qualification and experience of participants

Characteristics	Number	Percentage
Qualification		
Dental student	109	54.50
Dental intern	38	19
Graduate	42	21
Postgraduate	11	5.50
Clinical experience		
Undergraduate students	81	40.50
Less than 3 years	72	36
3-5 years	32	16
More than 5 years	15	7.50

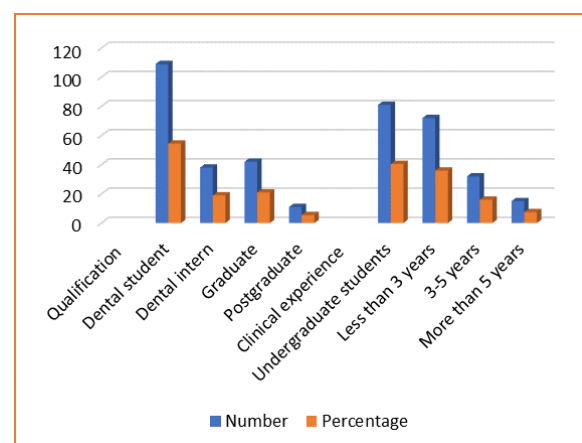


Figure: Qualification and experience of participants

Table 3: Knowledge of participants about dental caries concerning clinical experience and educational level

		Mean	SD	p value
Clinical Experience	Between groups	0.02	0.001	0.17
	Within groups	0.32	0.07	
Educational Level	Between groups	1.29	0.06	0.004
	Within groups	0.36	0.09	



Table: 4. Practice of participants about dental caries concerning clinical experience and educational level

		Mean	SD	p value
Clinical Experience	Between groups	0.48	0.11	0.49
	Within groups	0.32	0.13	
Educational Level	Between groups	1.56	0.15	0.005
	Within groups	0.39	0.08	

Discussion

Minimally invasive dentistry is a unique approach to treating caries that draws inspiration from the medical area. This new approach emphasizes caries risk assessment (CRA), the prevention of disease progression by eliminating cariogenic bacteria, early detection of caries, remineralization of early carious lesions, conservative cavity preparation, repairing defective restorations instead of replacing them, minimal surgical intervention, and careful cavity design. This research presents various viewpoints of dental students, dental interns, graduate and postgraduate students from four institutions about the diagnostic and therapeutic criteria for managing dental caries. They communicate their thoughts by drawing on their personal experiences, academic knowledge, and professional background. It indicates the potential presence of many ideologies that imply distinct methodologies. Dental caries is a continuous cycle that includes both remineralization and demineralization over time[14]. While various methods classify this condition, the International Caries Detection and Assessment System (ICDAS) has developed as a more comprehensive and suitable approach for modern minimally invasive treatments. Current guidelines suggest its use in clinical practice[15,16]. Recognizing the importance, there has been a longstanding acknowledgment of the necessity for dental students to have thorough and systematic training in this aspect of dentistry[17].

In the study of Anahita et al., students in the seventh semester showed better results in the assessment of caries stages, patient risk, and caries management

options. These students had typically more clinical experience than the participants in Center 1 who attended the sixth semester and had not worked with patients yet[18]. In the current study the clinical experience didn't exhibit a significant effect on knowledge and practice of participants, however, the education level of participants showed a significant relationship both with knowledge and practice of participants ($P=0.004$ and 0.001 respectively).

Edalia and Kassim's study found a notable relationship between the duration of practice and knowledge of advanced methods for diagnosing cavities ($p=0.048$)[19]. Similarly, another study highlighted a significant relationship between a practitioner's specialty and their knowledge and actions regarding evidence-based cavity management ($p=0.002$)[20]. Contrarily, the current study didn't show a significant impact of clinical experience on the knowledge and practices of the participants. However, it did reveal a significant association between the participants' education level and both their knowledge and practices ($P=0.004$ and 0.001 respectively). Similar results were found in the study of Anahita et al. which indicated that seventh-semester students demonstrated better comprehension in evaluating cavity stages, patient risks, and treatment options, likely due to their increased clinical exposure compared to sixth-semester participants at Center 1, who hadn't yet engaged with patients[18].

Conclusion

Based on the findings from this study using a questionnaire, it appears that dental practitioners have a limited level of knowledge linked to their clinical experience. To enhance this knowledge, it might be beneficial to incorporate structured methods for detecting and handling cavities within the clinical dental curriculum.

References

1. Veiga, N.; Figueiredo, R.; Correia, P.; Lopes, P.; Couto, P.; Fernandes, G.V.O. Methods of Primary Clinical Prevention of Dental Caries in the Adult Patient: An Integrative Review. *Healthcare* 2023, *11*, 1635.
2. Singh, O.; Pradhan, D.; Sharma, L.; Srivastava, R. Oral health knowledge, attitudes and practices of primary healthcare workers of Lucknow district: A



- cross-sectional study. *J. Fam. Med. Prim. Care* 2022, 11, 520–525.
3. Drummond, B.K.; Meldrum, A.M.; Boyd, D. Influence of dental care on children's oral health and wellbeing. *Br. Dent. J.* 2013, 214, E27.
4. Dickson-Swift, V.; Kenny, A.; Gussy, M.; McCarthy, C.; Bracksley-O'Grady, S. The knowledge and practice of pediatricians in children's oral health: A scoping review. *BMC Oral Health* 2020, 20, 1–10.
5. Garrocho-Rangel, A.; Lopez-Torre, M.E.; Santos-Diaz, M.A.; Torre-Delgadillo, G.; Flores-Arriaga, J.C.; Saadia, M.; Pozos-Guillén, A. Assessment of Pediatricians' Knowledge, Practices, and Attitudes on Oral Health/Care in Children in the Last Decade: A Systematic Scoping Review and Critical Reflection. *J. Clin. Pediatr. Dent.* 2022, 46, 262–272.
6. Krol, D.M. Children's oral health and the role of the pediatrician. *Curr. Opin. Pediatr.* 2010, 22, 804–808.
7. Alshunaiber, R.; Alzaid, H.; Meaigel, S.; Aldeeri, A.; Adlan, A. Early childhood caries and infant's oral health; pediatricians' and family physicians' practice, knowledge and attitude in Riyadh city, Saudi Arabia. *Saudi Dent. J.* 2019, 31, S96–S105.
8. Harnagea, H.; Couturier, Y.; Shrivastava, R.; Girard, F.; Lamothe, L.; Bedos, C.P.; Emami, E. Barriers and facilitators in the integration of oral health into primary care: A scoping review. *BMJ Open* 2017, 7, e016078.
9. Butera, A.; Maiorani, C.; Morandini, A.; Simonini, M.; Morittu, S.; Trombini, J.; Scribante, A. Evaluation of Children Caries Risk Factors: A Narrative Review of Nutritional Aspects, Oral Hygiene Habits, and Bacterial Alterations. *Children* 2022, 9, 262.
10. Padung, N.; Singh, S.; Awasthi, N. First Dental Visit: Age Reasons Oral Health Status and Dental Treatment Needs among Children Aged 1 Month to 14 Years. *Int. J. Clin. Pediatr. Dent.* 2022, 15, 394–397.
11. Herndon, J.B.; Tomar, S.L.; Lossius, M.N.; Catalanotto, F.A. Preventive oral health care in early childhood: Knowledge, confidence, and practices of pediatricians and family physicians in Florida. *J. Pediatr.* 2010, 157, 1018–1024.
12. Gambhir, R.S.; Batth, J.S.; Arora, G.; Anand, S.; Bhardwaj, A.; Kaur, H. Family physicians' knowledge and awareness regarding oral health: A survey. *J. Educ. Health Promot.* 2019, 8, 45.
13. Krol, D.M.; Whelan, K.; Section on Oral Health. Maintaining and Improving the Oral Health of Young Children. *Pediatrics* 2023, 151, e2022060417.
14. Machiulskiene V, Campus G, Carvalho JC, Dige I, Ekstrand KR, Jablonski- Momeni A, Maltz M, Manton DJ, Martignon S, Martinez- Mier EA, et al. Terminology of Dental Caries and Dental Caries Management: Consensus Report of a Workshop Organized by ORCA and Cariology Research Group of IADR. *Caries Res.* 2020; 54(1): 7-14.
15. Caries Risk Assessment and Management. [<https://www.ada.org/resources/research/science-and-research-institute/oral-health-topics/caries-risk-assessment-and-management>].
16. International Caries Detection and Assessment System (ICDAS II)–Manual criteria [<https://www.iccms-web.com>].
17. Schulte AG, Pitts NB, Huysmans MC, Splieth C, Buchalla W. European Core Curriculum in Cariology for undergraduate dental students. *Eur J Dent Educ.* 2011; 15: 9-17.
18. Anahita JM, Heike KS, Alexa T, Pia W, Monika HG, Rainer H, Felix K. Knowledge of undergraduate dental students regarding management of caries lesions. *BDJ Open.* 2022; 8:9.
19. Edalia LG and Kassim BA. Knowledge and practice of new advances in occlusal caries diagnosis and early caries management among dentists in Nairobi. *East African Medical Journal.* 2016; 93.
20. Togoo RA, Yaseen S, Zakirulla M, Nasim VS, Al Zamzami M. Oral hygiene knowledge and practices among school children in a rural area of southern Saudi Arabia. *Int. J. Contemp. Dent.* 2012; 3: 57-62.