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Evaluation Of Knowledge, Attitudes, And Practices Of Dental Undergraduates And Postgraduates Of Karachi In Treating Patients With Hyperactive Gag Reflex

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Abstract

Objective:

This study aims to assess dental health practitioner's knowledge, attitudes, and practices regarding hyperactive gag reflex management in patients visiting public and private dental settings in Karachi.

Materials and Methods:

A cross-sectional Knowledge, Attitude, and Practice (KAP) survey was conducted from October 2022 to June 2023 among dental students and practitioners in Karachi's public and private dental institutes.

Following Institutional Review Board approval, a sample of 469 participants was targeted using a 95% confidence level and a 5% margin of error. Out of 442 who agreed, 242 responses were included from seven dental colleges (two public, five private). A self-administered questionnaire, validated by pretesting, assessed demographic details and responses on gag reflex management knowledge, attitudes, and practices. Scores were categorized as good/poor knowledge and desirable/undesirable attitudes/practices. Statistical analysis was performed using SPSS version 22, with significance set at $p<0.05$.

Results:

Of the 242 participants, 157 (65%) were females and 85 (35%) males, aged 25-45 years. Most participants (63%) had less than two years of work experience. Impression-taking (54.9%) and intra-oral radiography (34.2%) were identified as common triggers for gag reflex. No significant difference was found in knowledge of hyperactive gag reflex treatment. However, postgraduate students demonstrated better practices and knowledge than undergraduates.

Conclusion:

Practical knowledge of hyperactive gag reflex management among dental practitioners remains limited. Enhanced education and training are necessary to improve practices, particularly among undergraduate students.

Key Words: Knowledge, Attitude, Practice, Gag reflex, managing Gag reflex

Introduction:

A gag reflex, also known as a pharyngeal reflex, is an involuntary neuromuscular activity that the body uses to protect itself from swallowing foreign objects (1). It may be manipulated by delivering the patients the right information about the surgery while maintaining an atmosphere of relaxation (2). The gag reflex is a healthy defense mechanism that prevents foreign objects from entering the pharynx, larynx, and trachea, ensuring an unobstructed airway (3). Severe gag reflexes during dental procedures, especially impressions, can disrupt treatment and cause discomfort. Effective management includes providing clear procedural information and fostering a calm, relaxed patient environment (4). Gagging is a common response to sensory stimulation of specific intraoral tissues, including the palatoglossal folds, tongue base, palate, uvula, and posterior pharyngeal wall, and non-tactile stimuli can also cause vomiting (5). Non-tactile triggers like dental odors or past experiences can cause gagging, discourage routine dental visits, worsen oral health, and necessitate costly treatments, often under general anesthesia for managing discomfort and procedures (6,7). Gagging is a significant issue influenced by local and systemic illnesses, anatomical factors, psychological issues, and iatrogenic causes (8). Dentists who effectively manage an overactive gag reflex can create a more relaxed and encouraging environment for patients, leading to improved adherence to prescribed therapies, reduced anxiety, and more consistent dental appointments (9). A patient-centered approach improves communication, trust, and fear reduction in managing overactive gag reflexes, enabling dentists to address patient's concerns more effectively (10). Johnson and Smith's research in 2021 highlighted the importance of addressing knowledge gaps in dental practices, suggesting that customized training programs can enhance the ability of practitioners to manage patients with unique

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requirements, potentially addressing hyperactive gag reflex instances (11). Dentist's treatment of patients with overactive gag reflexes significantly impacts their anxiety levels. Individualized, sensitive strategies can help decrease anxiety related to dental procedures (12). By evaluating dentists' ability to treat patients with hyperactive gag reflexes, dental educators may identify areas of training that need improvement, improving dental practitioners' educational interventions and curriculum (13). Dental professionals' evidence-based methods and optimistic attitudes significantly improve treatment for hyperactive gag reflex patients, enhancing oral health outcomes and patient experience (14). In Karachi, where ethnic and socioeconomic variables might impact medical procedures, it is crucial to investigate how dentists deal with the difficulties caused by an overactive gag reflex. This study aims to evaluate Karachi dentists' knowledge, attitudes, and practices about treating patients with overactive gag reflexes. By assessing these variables, we can find any gaps in dental practice and knowledge that would prevent us from providing the best care possible to patients who have this disease.

Methodology

Study Design

This study was a cross-sectional, questionnaire-based Knowledge, Attitude, and Practice (KAP) study conducted at private and public dental institutes in Karachi, Pakistan.

Description of the selection of observational

Participants included undergraduate and postgraduate dental students from seven dental colleges (two government and five private) in Karachi. Students were recruited based on their experience with managing patients with a hyperactive gag reflex.

Study Setting

The study was conducted in Karachi's public and private dental institutes.

Study Duration

From October 2022 to June 2023.

Sampling Method

A stratified sampling method was used, ensuring a proportional representation of undergraduate and postgraduate dental students across the included institutions.

Sample Size

The survey included 442 participants, with 315 having experience managing hyperactive gag reflex patients. Out of these, 242 were recruited, excluding 73 due to incomplete responses. The sample size was calculated with a 95% confidence level and 5% margin of error with a reference study (15).

Inclusion Criteria:

- Undergraduate and postgraduate dental students.
- Participants with prior experience managing patients with a hyperactive gag reflex.

Exclusion Criteria:

- Participants with incomplete questionnaire responses.

Variables

Independent Variables:

- Demographic information (age, gender, educational level).
- Experience with patients presenting hyperactive gag reflexes.

Dependent Variables:

- Knowledge scores on managing hyperactive gag reflex.
- Attitude and practice scores related to managing hyperactive gag reflex.

Data Collection Procedure:

Data collection was conducted using a self-administered questionnaire drafted in English. The questionnaire consisted of three sections addressing dental practitioners' knowledge, attitudes, and practices regarding hyperactive gag reflex management. Pre-testing was conducted to ensure its validity. Data collectors were trained for effective data collection under close supervision by the principal investigator, drugs or chemicals were used in this study.

Ethical Review

The Institutional Review Board (IRB application # IRB/D—000044/22) at Liaquat College of Medicine and Dentistry, Karachi, Pakistan, approved the study. All participants provided informed consent before completing the questionnaire.

Statistical Analyses:

Statistical analysis was performed using SPSS software version 22. Descriptive statistics were reported as frequencies and percentages. Knowledge-related responses were categorized as strongly disagree/maybe/strongly agree and scored as 2 for good knowledge and 1 for poor knowledge. Attitude and practice responses were scored similarly. Cumulative scores were calculated for each participant. Inferential statistics were applied using ordinal regression analysis for calculating odds ratios and confidence intervals with a maximum likelihood ratio test ($p < 0.05$) to identify associations between variables.

Results

In this study, 157 females (65%) and 85 males (35%) among 242 participants were interviewed. The age of participants ranges from 25 to 45 years. A total of 152 (63%) of participants had less than 2 years of work experience, 58(24%) had 3- 5 years, and 32 (13%) had 6-10 years. (Table 1)

Table 1: Basic demographic variables

Characteristics	Postgraduate	Undergraduate	Total
Age Group <25 years 26 to 35 years 36-45 years	4(5.1%) 64(82.1%) 10(12.8%)	83(50.6%) 67(40.9%) 14(8.5%)	87(36.0%) 131(54.1%) 24(9.9%)
Gender Male Female	21(26.9%) 57(73.1%)	64(39%) 100(61%)	85(35.1%) 157(64.9%)
Current job title House officer Post-graduate resident Demonstrator/lecturer Assistant/Associate professor	0 55(70.5%) 0 23(29.5)	92(56.1%) 0 72(43.9%) 0	95(39.3%) 64(26.4%) 64(26.4%) 19(7.8%)
Experience ≤2 years 3-5 year 6-10 year	28(36%) 25(32%) 25(32%)	124(75.6%) 33(20.1%) 7(4.3%)	152(62.8%) 58(24.0%) 32(13.2%)
Procedure Associated with Gag Radiograph Impression taking Scaling and polishing Rubber dam application	37(47.4%) 41(52.6%)	66(40.2%) 92(56.1%) 5(3.0%) 1(.6%)	103(42.6% 133(54.9%) 5(2.1%) 1(0.4%)

This study's results show that taking an impression was the most frequent cause of gag reflex (54.9%) among patients, followed by intra-oral radiography with 34.2%, as shown in Figure 1.

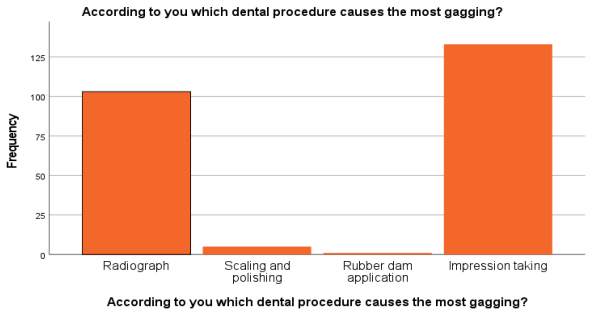

Figure 1. Bar graph showing the causes of Gag Reflex according to study participants.

Our study result displays that that is no significant difference in dentists' knowledge regarding the treatment of hyperactive gag reflex, whereas maintaining a calm environment to reduce gag reflex showed a significant difference in dentists' knowledge. The majority of dentists (73.5%) suggested that using a poor clinical technique of procedure usually provokes a gag reflex in patients not normally prone to gagging. Dentists (62.8%) also suggested that the majority of patients experience gagging even when they think of a dental procedure as shown in Table 2.

Table 2 Knowledge of Undergraduates and Postgraduates dental practitioners

Variable	Postgraduate	Undergraduate	Total	P-value
Natural healthy mechanism Strongly DA/ DA May be/ not sure Strongly A /A	 5(6.4%) 20(25.6%) 53(67.9%)	 18(11%) 26(15.9%) 120(73.2%)	 23(9.5%) 46(19%) 173(71.5%)	0.134
Gag reflex trigger zones Strongly DA/DA May Be/ Not sure Strongly A/ A	 10(12.8%) 42(53.8%) 26(33.3%)	 23(14%) 84(51.2%) 57(34.8%)	33(13.6%) 126 (52.1%) 83(34.3%)	0.924
Anxiety can cause gagging Strongly DA/ DA May be Strongly A/A	 4(5.1%) 11(14.1%) 63(80.8%)	 13(7.9%) 29(17.7%) 122(74.4%)	 17(7.0%) 40(16.5%) 185(76.4%)	0.527

Calm environment reduce gagging Strongly DA/DA Maybe / not sure Strongly A/ A	 11(14.1%) 11(14.1%) 56(71.8%)	 17(10.4%) 52(31.7%) 95(57.9%)	 28(11.6%) 63(26.0%) 151(62.4%)	**0.014***
Behavioral to avoid gagging Strongly DA/DA May be Strongly A/ A	 4(5.1%) 19(24.4%) 55(70.5%)	 11(6.7%) 40(24.4%) 113(68.9%)	 15(6.2%) 59(24.4%) 168(69.4%)	 0.890
Experience gagging even when they think of a dental procedure Strongly DA /DA May Be Strongly A/A	 7(9.0%) 20(25.6%) 51(65.4%)	 16(9.8%) 47(28.7%) 101(61.6%)	 23(9.5%) 67(27.7%) 152(62.8%)	 0.848
The poor clinical technique of a procedure may elicit a gag reflex Strongly DA/ DA Maybe Strongly A/A	 4(5.1%) 10(12.8%) 64(82.1%)	 19(11.6%) 31(18.9%) 114(69.5%)	 23(9.5%) 41(16.9%) 178(73.6%)	0.100

Table 3 shows a significant difference in attitude among dentists regarding the gag reflex causing hindrance to dental treatment.

Table 3: Attitude of Undergraduates and Postgraduates dental practitioners

Variable	Postgraduate	Undergraduate	Total	P-Value*
feel confident while treating a patient with a hyperactive gag reflex Never Sometimes Mostly/Always	 4(5.1%) 33(42.3%) 41(52.6%)	 15(9.1%) 68(41.5%) 81(49.4%)	 19(7.9%) 101(41.7%) 122(50.4%)	0.548
I feel that the patients with hyperactive gag reflex should be treated under GA Never Sometimes Mostly/Always	 15(19.2%) 56(71.8%) 7(9%)	 54(32.9%) 96(58.5%) 14(8.5%)	 69(28.5%) 152(62.8%) 21(8.7%)	0.083
Gag causes hindrance to dental treatment Never Sometimes Mostly/Always	 0 49(62.8%) 29(37.2%)	 12(7.3%) 91(55.5%) 61(37.2%)	 12(5.0%) 140(58%) 90(37%)	**0.04***

Table 4 showed that many dentists deal with hyperactive gag reflex by calling patients with an empty stomach (50.4%). Some dentist prefer to apply topical anesthesia on soft palate (48%) whereas majority dentist do not favor the application of local anesthesia on the soft palate (52%). Around 84.7% of dentist deal with gag reflex by distracting their attention from dental procedures. Dentists elected to treat by their own self and reject to refer to another dentist.

Table 4: Practices of Undergraduates and Postgraduates dental practitioners

Variable	Postgraduate	Undergraduate	Total	P-value*
Gag Severity Index Never Sometimes Mostly/ Always	 49(62.8%) 22(28.2%) 7(9.0%)	 81(49.4%) 67(40.9%)	 130(53.7%) 89(36.8%) 23(9.5%)	 0.128

		16(9.8%)		
Sedative Medication Never Sometimes Mostly/ Always	 28(35.9%) 44(56.4%) 6(7.7%)	 84(51.2%) 67(40.9%) 13(7.9%)	 112(46.3%) 111(45.9%) 19(7.9%)	 0.065
NPO before procedure Never Sometimes Mostly/ Always	 11(14.1%) 44(56.4%) 23(29.5%)	 48(29.3%) 78(47.6%) 38(23.2%)	 59(24.4%) 122(50.4%) 61(25.2%)	 **0.036***
Briefing for hyperactive gag reflex Never Sometimes Mostly/ Always	 2(2.6%) 15(19.2%) 61(78.2%)	 3(1.8%) 28(17.1%) 133(81.1%)	 5(2.1%) 43(17.8%) 194(80.2%)	 0.847
Topical Anesthesia Never Sometimes Mostly/ Always	 17(21.8%) 47(60.3%) 14(17.9%)	 68(41.5%) 69(42.1%) 27(16.5%)	 85(35.1%) 116(47.9%) 41(16.9%)	 **0.008***
Local Anesthesia Never Sometimes Mostly/ Always	 33(42.3%) 28(35.9%) 17(21.8%)	 93(56.7%) 57(34.8%) 14(8.5%)	 126(52.1%) 85(35.1%) 31(12.8%)	 **0.009***
Provide calm Environment Never Sometimes Mostly/ Always	 0 14(17.9%) 64(82.1%)	 5(3.0%) 29(17.7%) 130(79.3%)	 5(2%) 43(18%) 194(80%)	 0.297
Distract the Patient attention Never Sometimes Mostly/ Always	 2(2.6%) 9(11.5%) 67(85.9%)	 5(3.0%) 21(12.8%) 138(84.1%)	 7(2.95%) 30(12.4%) 205(84.7%)	 0.937
Terminate procedure during reflex Never Sometimes Mostly/ Always	 11(14.1%) 53(67.9%) 14(17.9%)	 35(21.3%) 99(60.4%) 30(18.3%)	 46(19.0%) 152(62.8%) 44(18.2%)	 0.378
Refer to another dentist Never Sometimes Mostly/ Always	 61(78.2%) 14(17.9%) 3(3.8%)	 87(53.0%) 58(35.4%) 19(11.6%)	 148(61.2%) 72(29.8%) 22(9.1%)	 **0.001***

In Table 5, the comparison of mean scores of knowledges, attitude, and practices between undergraduate and postgraduate dentists is presented. The scores depicted a higher level of all three domains among postgraduates as compared to undergraduate dentists. Although, the scores differ but no statistically significant difference is noted.

Table. 5 Comparison of Knowledge, Attitude and Practices scores between Undergraduates and Postgraduates

Domains	Scores of Undergraduates Mean ±SD	Scores of Postgraduates Mean ±SD	P-value*
Knowledge (Total Score = 14)	10.7 ± 2.23	11.1 ±2.38	0.84
Attitude (Total Score = 6)	3.4 ±1.08	3.7 ±0.90	0.22
Practices (Total Score = 20)	10.3 ±3.11	10.8 ±2.31	0.12

*p-value is calculated by the Mann-Whitney test and significance level<0.05

Discussion:

Postgraduate students generally demonstrate better knowledge and practices in managing gag reflexes compared to undergraduates. A study found that 127 postgraduate students identified anxiety and fear as the main reasons for gag reflex in children (16). However, only 30% of dental students were aware that there was no change in pulse rate during gag reflex, indicating gaps in knowledge (16). Interestingly, while postgraduates showed better knowledge, their attitude and practice towards managing children with gag reflexes was found to be lacking. For instance, 92.6% of postgraduate students did not use the gagging severity index or gag prevention index before treating children with gag reflex (16). This contradicts the general trend of postgraduates having better practices, as seen in other areas like medical emergency management, where postgraduates performed better than interns (17). Undergraduate dental students' limited knowledge and practices in gag reflex management stem from insufficient clinical exposure, curriculum gaps, and lack of specialized training. Resource constraints, inadequate mentorship, and limited focus on patient psychology and anxiety management further exacerbate the issue. The curriculum's emphasis on fundamental skills over specialized techniques and the absence of dedicated workshops hinder students' proficiency in this crucial area of dental practice. Additionally, limited access to current research and evidence-based practices impedes students' ability to stay updated on effective management strategies. Based on the provided context, there is limited direct information about factors contributing to low knowledge and practices among undergraduate dental students in gag reflex management. However, we can infer some potential factors from the available information:

1. The studies primarily focus on postgraduate students and practicing dentists, suggesting that undergraduate education may not adequately cover gag reflex management (18,19). For instance, reveals that many postgraduate students lack proper knowledge and practice in managing gag reflex in children, which could indicate a gap in undergraduate education (17).
2. The multifactorial nature of the gag reflex and its management may contribute to the complexity of teaching and learning this topic. The diverse range of causes, including physiological, psychological, and anatomical factors, as well as the variety of management techniques, could make it challenging for undergraduate students to grasp and apply this knowledge effectively (20,21).
3. The lack of awareness about certain management techniques, such as acupuncture, among dental students (18). Another study recommends that some effective methods may not be included in the undergraduate curriculum (22,23). This limited exposure to various management techniques could contribute to low knowledge and practices.

Limitations:

The study specifically mentions Pakistani undergraduate dental students, which may limit the generalizability of findings to other countries or regions. The study does not address potential confounding factors that might influence students' knowledge and practices, such as individual learning styles or prior clinical experiences. Further, the study relied on self-reported data from students, there might be issues with accuracy and potential overestimation or underestimation of knowledge and practices.

Conclusion:

In conclusion, while dental postgraduates generally have better knowledge about gag reflex management, there is a need for improvement in both undergraduate and postgraduate education regarding the practical application of this knowledge. The study suggests that the emphasis on practicing preventive dentistry, which could include gag reflex management, is not adequate in the current dental curriculum (24). While hands-on training and simulated scenarios can be beneficial, they may not fully replicate the unpredictability of real patient interactions. Furthermore, implementing additional workshops and clinical rotations could potentially overburden an already packed dental curriculum, potentially compromising other essential aspects of dental education. Moreover, Interdisciplinary collaboration and virtual reality simulations can enhance gag reflex management training, though challenges in scheduling, resources, and integration into curricula may hinder their practical implementation. These immersive experiences could be tailored to various difficulty levels, allowing students to progressively build their confidence and skills. Furthermore, establishing mentorship programs where experienced dentists guide students through challenging cases could provide invaluable insights and practical tips for managing gag reflexes effectively. This indicates a need for changes in dental education to improve knowledge, attitudes, and practices regarding such challenges in dental procedures. This gap in practical application skills highlights the importance of incorporating hands-on training and simulated scenarios into dental curriculums.[24] Implementing workshops or clinical rotations specifically focused on gag reflex management could provide students with valuable experience in real-world situations. Additionally, integrating interdisciplinary approaches, such as collaborating with psychology departments, may offer

innovative strategies for managing patient anxiety and reflexes during dental procedures (24,25).

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Dr. Arsalan Shahid: Conception and Design of work, drafting.
Dr. Muhammad Sarmad Khan: Manuscript writing final data approval and analysis.
Dr. Soha Arif: Data analysis and interpretation.
Dr. Sareema Ahmed: Data collection and support in final draft.
Dr. Muhammad Asshad Khan: Data collection and organization.
Professor Dr. Asya Rehman: Interpretation and Co Supervision.