



EVALUATION OF KNOWLEDGE, ATTITUDE, AND PRACTICES AMONG DENTAL STUDENTS AND TEACHERS ABOUT VARIOUS DENTAL APPS FOR BEHAVIOUR MANAGEMENT IN PEDIATRIC PATIENTS: AN INSTITUTIONAL BASED SURVEY.

Pedodontics

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ABSTRACT

Pediatric dentistry presents unique challenges, primarily due to the developmental and psychological needs of children. Effective behavior management is pivotal in delivering successful pediatric dental care, with nearly all dental professionals recognizing its critical role. While traditional non-pharmacological techniques like tell-show-do and positive reinforcement have long been established, the integration of digital technologies—such as mobile applications and audiovisual tools—offers new avenues to enhance cooperation and reduce dental anxiety among children. This study aimed to evaluate the knowledge, attitude, and practices (KAP) among dental students and faculty regarding the use of mobile dental apps for behavior management in pediatric dentistry. **Methodology:** A cross-sectional survey was conducted using a structured and pre-validated 16-item questionnaire. The survey was disseminated online via Google Forms among 270 participants, including undergraduate students, interns, postgraduate students, and faculty members from a single dental institution. After excluding incomplete responses, data from 233 participants were analyzed. The questionnaire assessed three domains: knowledge of digital tools, attitude towards their integration into pediatric practice, and current usage practices. **Results:** The mean age of participants was 29.21 ± 6.68 years, with a nearly even gender distribution (51% male, 49% female). The analysis revealed significant differences across academic groups in knowledge ($p < 0.001$), attitude ($p < 0.001$), and overall KAP scores ($p < 0.001$), but not in practice ($p = 0.648$). Postgraduate students and faculty exhibited higher knowledge and attitude scores compared to undergraduates. Interns also showed elevated knowledge levels. However, the usage of dental apps in practice remained low across all groups, indicating a gap between awareness and actual implementation. Gender-wise analysis showed no statistically significant differences in knowledge, attitude, practice, or overall KAP scores. Notably, a strong positive correlation was found between knowledge and attitude ($r = 0.620$, $p < 0.001$), suggesting that higher knowledge may foster favorable attitudes toward using digital tools. However, there was no significant correlation between knowledge and practice ($r = -0.007$, $p = 0.927$), and a moderate negative correlation was observed between attitude and practice ($r = -0.366$, $p < 0.001$), indicating a disconnect between perceived utility and actual application. **Conclusion:** Although dental students and faculty generally recognize the potential of mobile applications as adjuncts to traditional behavior management techniques, their real-time clinical use remains limited. The study highlights a critical gap between knowledge/attitude and practical adoption, suggesting the need for curricular reforms that incorporate digital behavior management training. Institutional support, faculty development programs, and clinical exposure to app-based tools are essential to bridge this gap and optimize pediatric patient care.

KEYWORDS

Behavior management, pediatric dentistry, dental apps, digital tools, dental education, technology integration.

INTRODUCTION

Pediatric dentistry is uniquely challenging due to the developmental, psychological, and emotional needs of children. One of the most critical aspects in the successful delivery of dental care to pediatric patients is effective behavior management. Anxiety and uncooperative behavior are common barriers to treatment in children, often resulting in compromised care outcomes and increased stress for both the patient and the practitioner. In fact, a striking 99.73% of dental practitioners recognize behavior management as an essential component of pediatric clinical practice, underscoring its significance in routine dental care. [1]

Traditionally, non-pharmacological behavior guidance techniques such as the tell-show-do method, voice control, and positive reinforcement have formed the cornerstone of pediatric dental practice. These methods aim to foster trust and cooperation through structured communication and behavior shaping. However, with the rapid advancement of digital technology, there is growing interest in integrating innovative tools—such as mobile dental applications, virtual reality, and interactive audiovisual aids—into clinical settings as supplementary behavior management strategies. These digital adjuncts have the potential to enhance patient engagement, reduce anxiety, and improve treatment compliance by leveraging familiar and interactive formats that appeal to younger age groups. [2]

Given the evolving landscape of pediatric dentistry, it becomes imperative to assess the awareness, attitudes, and preparedness of future dental professionals and educators toward the adoption of these emerging technologies. This institutional survey aims to evaluate the readiness of dental students and faculty members to incorporate digital tools, particularly dental apps, as adjuncts to traditional behavior management techniques in pediatric dentistry. [3]

MATERIALS AND METHODS

This study employed a cross-sectional, questionnaire-based survey design to assess the knowledge, attitudes, and practices (KAP) of

dental students and dental faculties regarding the use of digital tools, specifically app-based behavior management strategies, in pediatric dentistry. Ethical approval for the study was obtained from the Institutional Ethics Committee prior to data collection, and informed consent was acquired from all participants.

Inclusion Criteria

- Undergraduate III year and final year students and Interns.
- Post Graduate students
- Faculty members

Exclusion Criteria

- Undergraduate I year and II year students
- Participants not willing to participate in the study

Sample Size

A total of 270 participants—including undergraduate, interns, postgraduate dental students and dental faculty members were recruited from the institution. The inclusion criteria encompassed individuals currently enrolled in the institution, while incomplete responses and those not meeting the inclusion criteria were excluded.

Data were collected using a structured and pre-validated questionnaire comprising 16 closed-ended items. A prevalidated questionnaire was taken for the study. The instrument was designed to evaluate three key domains:

- Knowledge:** Participants' awareness and familiarity with digital and app-based behavior management tools.
- Attitude:** Perceptions regarding the effectiveness, utility, and integration potential of such digital innovations in pediatric clinical settings.
- Practice:** Current use and frequency of adoption of digital tools in routine pediatric dental practice.

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The responses were measured in the form of 'yes' or 'no'. The questionnaire was sent in the form of google forms to participant's respective email IDs.

The collected data were entered and analyzed using **IBM SPSS Statistics for Windows, Version 20.0** (IBM Corp., Armonk, NY). Descriptive statistics such as frequencies and percentages were used to summarize demographic data and response distributions. Pearson correlation analysis was employed to assess the relationships among knowledge, attitude, and practice domains. A p-value of <0.05 was considered statistically significant.

RESULTS

Table 1. Comparisons of Group Means with p-Values with regard to Category and Knowledge, attitude, practice and overall KAP Score

Category	Knowledge(Mean $\pm$ SD)	Attitude(Mean $\pm$ SD)	Practice(Mean $\pm$ SD)	KAP Score(Mean $\pm$ SD)
UG	1.89 $\pm$ 1.039	2.05 $\pm$.749	1.96 $\pm$.873	5.91 $\pm$ 1.517
Intern	5.50 $\pm$ 1.195	3.25 $\pm$ 1.389	1.75 $\pm$.886	10.50 $\pm$ 1.195
PG	5.88 $\pm$ 1.239	3.92 $\pm$ 1.066	1.86 $\pm$.808	11.66 $\pm$ 1.733
Faculty	5.36 $\pm$ 1.397	3.64 $\pm$ 1.137	2.02 $\pm$.854	11.02 $\pm$ 2.125
F value	115.197	36.008	.551	112.687
p-Value	<.001	<.001	.648	<.001

Table 2. Comparisons of Group Means with p-Values with regard to gender and Knowledge, attitude, practice and overall KAP Score

Category	Knowledge(Mean $\pm$ SD)	Attitude(Mean $\pm$ SD)	Practice(Mean $\pm$ SD)	KAP Score(Mean $\pm$ SD)
Male	4.46 $\pm$ 2.133	3.16 $\pm$ 1.241	1.97 $\pm$.826	9.59 $\pm$ 2.875
Female	5.54 $\pm$ 1.325	3.35 $\pm$ 1.317	1.94 $\pm$.871	9.88 $\pm$ 3.179
t value	-.445	-1.051	.265	-.676
p-Value	.657	.295	.791	.5

Table 3. Correlation among Knowledge, attitude and practice score by Pearson's Correlation coefficient

Variables	r	p-value
Between Knowledge and attitude	.620	<.001
Between Knowledge and Practice	-.007	.927
Between attitude and Practice	-.366	<.001

The data from this study, involving 233 participants with a mean age of 29.21 $\pm$ 6.68 years, were analyzed using MS Excel and IBM SPSS software (version 20.0). Percentages were calculated, and a p-value of ≤ 0.05 was set as the threshold for statistical significance.

Comparison By Category (UG, Intern, PG, Faculty): Analysis of variance (ANOVA) was used to compare means between different categories (UG, Intern, PG, Faculty) concerning knowledge, attitude, practice, and overall KAP scores.

- **Knowledge:** There was a statistically significant difference in knowledge scores among categories ($F=115.197$, $p<0.001$). Interns (5.50 $\pm$ 1.195), PGs (5.88 $\pm$ 1.239), and Faculty (5.36 $\pm$ 1.397) showed considerably higher knowledge scores compared to UG students (1.89 $\pm$ 1.039).
- **Attitude:** A significant difference in attitude scores was observed across categories ($F=36.008$, $p<0.001$). PGs had the highest attitude scores (3.92 $\pm$ 1.066), followed by Faculty (3.64 $\pm$ 1.137) and Interns (3.25 $\pm$ 1.389), with UG students scoring lowest (2.05 $\pm$ 0.749).
- **Practice:** No statistically significant difference was found in practice scores among categories ($F=0.551$, $p=0.648$).
- **Overall KAP Score:** The overall KAP score also showed a significant difference across categories ($F=112.687$, $p<0.001$). PGs (11.66 $\pm$ 1.733), Faculty (11.02 $\pm$ 2.125), and Interns (10.50 $\pm$ 1.195) had much higher overall KAP scores than UG students (5.91 $\pm$ 1.517).

Comparison By Gender: An independent t-test was performed to compare means between genders (Male and Female) for knowledge, attitude, practice, and overall KAP scores.

- No statistically significant differences were found between males and females in knowledge ($p=0.657$), attitude ($p=0.295$), practice ($p=0.791$), or overall KAP scores ($p=0.5$). Females generally had slightly higher mean scores across all four areas compared to males, but these differences were not statistically significant.

Correlations Among Knowledge, Attitude, And Practice: Pearson's correlation coefficient was used to calculate correlations among knowledge, attitude, and practice scores.

- **Knowledge and Attitude:** A strong positive correlation was found between knowledge and attitude ($r=0.620$, $p<0.001$). This suggests that as knowledge increases, attitude tends to improve.
- **Knowledge And Practice:** There was no significant correlation between knowledge and practice ($r=-0.007$, $p=0.927$).
- **Attitude And Practice:** A moderate negative correlation was observed between attitude and practice ($r=-0.366$, $p<0.001$). This indicates that as attitude scores increase, practice scores tend to decrease, which is an interesting finding that might warrant further investigation.

DISCUSSION

The present study evaluated the knowledge, attitude, and practices (KAP) of dental students and faculty members regarding the use of digital behavior management tools—particularly mobile dental applications—in pediatric dentistry. With the rapid digitization of healthcare and increasing exposure of younger populations to technology, such tools are emerging as potential adjuncts to conventional non-pharmacological behavior guidance methods.

Our results demonstrated significant differences in knowledge and attitude levels among various academic groups, with postgraduates (PGs) and faculty members showing notably higher scores than undergraduate students. These findings are in line with previous research by Patel et al. (2022) [4], who found that postgraduate dental trainees exhibited greater digital literacy and openness to adopting mobile applications for clinical use than their undergraduate counterparts.

The strong positive correlation observed between knowledge and attitude ($r=0.620$, $p<0.001$) supports the assertion that improved awareness and understanding of digital tools foster more favorable attitudes toward their use. This reflects similar trends reported by Owais et al. (2020) [5], where familiarity with mobile dental apps was a strong predictor of positive attitudes toward their clinical integration.

Interestingly, the current study found no significant differences in practice scores across groups, and practice did not correlate positively with either knowledge or attitude. In fact, there was a moderate negative correlation between attitude and practice ($r = -0.366$, $p<0.001$). This disconnect suggests a possible implementation gap, potentially due to institutional limitations, lack of clinical infrastructure, or insufficient hands-on exposure. Prior research by George and Janam (2020) [6] similarly reported that although dental students expressed interest in using mobile apps for patient management, actual use in clinical settings remained limited due to a lack of formal training and guidelines.

Moreover, gender did not significantly influence any of the KAP domains, aligning with the findings of Mathew et al. (2019), [7] who also observed no significant gender-based variation in the adoption of digital health tools among dental professionals.

The integration of mobile apps and virtual tools in pediatric behavior management has been gaining traction. A study by Al-Halabi et al. (2018) [8] reported that smartphone-based distraction techniques, including apps and games, effectively reduced dental anxiety in children. However, they also noted the need for clinician training and institutional support for routine implementation.

In contrast, a study by Vagnoli et al. (2019) [9] cautioned against overreliance on digital distractions, emphasizing that such tools may not be universally effective and should complement—not replace—traditional communication-based behavior guidance techniques.

The evident gap between knowledge/attitude and actual practice suggests a need for curriculum reform. Incorporating structured modules on digital behavior management tools, including hands-on training and supervised clinical use, may enhance practical adoption.

Furthermore, institutional investment in digital infrastructure and app-based platforms is crucial. Faculty development programs can also ensure that educators are equipped to guide students in responsibly leveraging such technologies.

CONCLUSIONS

The current study shows that while dental faculties and students have positive attitudes and sufficient knowledge on the use of mobile applications in pediatric behavior management, their clinical translation into practice is still inadequate. A key implementation gap is highlighted by the observed discrepancy between awareness and application, which calls for institutional facilitation, systematic hands-on training, and curriculum integration of digital behavior control modules. It is advised that multicentric and longitudinal studies be conducted in the future to assess the clinical effectiveness of these digital therapies in greater detail and to create standardized procedures for their methodical integration into pediatric dentistry.

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