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Patient-Centered Communication Training for Dental Assistants: Impact on Anxiety Reduction in Pediatric Dental Visits

Fatimah z. Alkashi[1], Lujain A. Basim[1], Aisha H. Ghazwani[1]

[1]Dental Assistant Alahsa health cluster, Saudi Arabia.

ABSTRACT

Background: Dental anxiety is a prevalent impediment to successful pediatric oral treatment, which commonly leads to avoidance of treatment, behavioral difficulties, and poorer oral health results. It has been established that patient-centered communication can reduce anxiety, although not much is known about the exact role of dental assistants in implementing the said strategies during the visit of a dentist with children. Methods: It was a quasi-experimental study to test the effect of structured patient-centered communication training in dental assistants when it comes to reducing anxiety in children attending routine dental visits. There were 480 encounters of pediatrics initially documented and 408 (85.0) of the original encounters retained following exclusions. Respondents were placed either in the intervention group, in which the dental assistants would undergo a two-day guided communication workshop (n = 206, 50.5%), or in the control group, in which dental assistants would receive regular care (n = 202, 49.5%). The Modified Child Dental Anxiety Scale (MCDAS) was used to measure child anxiety prior to and following the visit. One of the subsets of encounters (n = 180, 36.5%) involved heart rate monitoring as a physiological measure of anxiety and 48 (10%)-visits were audio-recorded so as to determine fidelity.Results: The children in the treatment group showed a significant difference in anxiety scores relative to the control group (mean difference: 3.2 ± 1.1 vs. 1.4 ± 0.9, $p < 0.001$). The analysis of heart rate showed that there was more reduction in the intervention group (-9.8 bpm) than in the controls (-3.4 bpm). Conclusion: The training of dental assistants on patient-centered communication was effective to reduce patient dental anxiety subjectively and physiologically (83% vs. 18% in controls, ICC = 0.78). The results highlight the significance of training auxiliary personnel in organized communicational skills to increase the level of child comfort and maximize the results of pediatric dental treatment.

KEYWORDS: Dental anxiety; Dental assistants; Pediatric dentistry; Patient-centered communication; Communication training; Anxiety reduction; Child dental care.

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INTRODUCTION

Dental anxiety has traditionally been considered one of the leading challenges of pediatric oral health care, which affects the experience and the effectiveness of treatment in a child. New literature indicated that dental assistants were the key points to increase patient comfort and decrease anxiety as critical components of the dental team [1].Familiar environments and lack of communication also tended to encourage anxiety in clinical settings especially in children. Patient-centered communication was also named as a factor that could reduce such fears to a minimum since it was proved to be effective in reducing anxiety and reducing the necessity to apply sedation or anesthesis in pediatric medical and dental procedures [2].

Empathy became the focus in research as an important aspect of patient experiences. It was discovered that empathetic providers were highly effective in the reduction of dental anxiety and the probability of returning to the clinic in the future, further supporting the use of interpersonal care to maintain oral health behaviors[3]. Equally, researches highlighted that patient-reported outcome measure (PROM) might be employed to measure and treat dental phobia, especially among the vulnerable members of the society like children with special needs [4]. These results implied that the incorporation of caring, patient-centered practices into the daily practice was the key to helping children have positive dental experiences.

Dental experiences of pediatrics were also significantly influenced by behavioral management methods. Tell-show-do and positive reinforcement, distraction strategies were one of the most popular strategies to decrease anxiety and enhance cooperation [5]. Yet, in addition to these methods, interpersonal communication between the dental employees and patients was regarded as being one of the foundations of quality care. Dentist-patient communication systematic reviews provided evidence on systematic reviews to show its effect on patient trust, patient satisfaction and overall treatment success [6]. In addition, new human-oriented interventions to dental sedation in children indicated the relevance of addressing psychological comfort in treating children besides the clinical treatment[7].The wider literature also indicated the efficacy of patient-centered approach in alleviating fear among children and even adults. Patient-centered communication has been demonstrated in adult populations to reduce dental fear and enhance compliance with treatment [8]. Dentist-patient relationships and trust, as well as effective communication were directly linked to the achievement of better care outcomes in pediatric dentistry [9]. Communicative team-based approaches that engaged dentists, hygienists, and dental assistants in addressing anxious or special-needs patients further proved the need of a team-based approach to the treatment [10].

The strategies of patient-centered care were also addressed as the possible solutions to the dental anxiety management in the context of other cultures. Research in Iraq showed that a communication-based intervention resulted in a greater positive attitude of patients towards the care provided and a decrease in the level of anxiety [11]. In Taiwan, the attempts to introduce communication education into the dental training process emphasized the possibility of preparing the providers to provide care of a more patient-centered type [12]. In the same manner, the development of modern communication technologies was also reported to revolutionize the interaction between patients and providers, and make dental care more personalized and effective[13].

This discussion continued to focus on the views of patients. Researchers concluded that negative perceptions of care were always recorded in patients with dental anxiety when there was a lack of effective communication, whereas positive and sympathetic ones lowered the fear and enhanced compliance [14]. Moreover, the creation of the scales of patient-centered care confirmed as essential the idea of communication and empathy in primary care dentistry and provided the means of measuring and applying the practices in a more efficient way[15].

Collectively, the findings led to the conclusion that dental assistants, with the help of organized communication training, have the potential to have a transformative impact on pediatric dental anxiety. There was little empirical data looking at the direct impact of communication training for dental assistants in pediatric dentistry, despite the fact that previous research had shown the general influence of empathy and communication on patient outcomes. By assessing whether structured, patient-centered communication training for dental assistants decreased pediatric patients' anxiety during dental visits, this study sought to close that gap.

LITERATURE REVIEW

Dental anxiety is a major issue in pediatric dentistry which usually results in avoidance, disruptive behavior and unfavorable long term oral health. Literature has continuously demonstrated that communication is the core of the process of dental fear reduction and overall better treatment outcomes [2, 3]. Patient-centered, empathetic communication not only reduces anxiety but also has a higher chance of encouraging adherence to treatment and positive postdischarge patterns [4, 6].

Dental assistants are becoming more and more significant players in the patient experience. They are the initial contact and are influential in the formation of perception of the child towards the dental environment. Research has shown that patient anxieties and discomfort may be greatly minimized through assistants who have acquired training in communication methods [1, 10]. Assistants assist in closing the divide between the dentist and patient; especially in pediatric care through supportive policies like active listening, reassurance, and simplified explanations.

Reliable communication has been emphasized as one of the factors that define a successful pediatric dental care. It was also revealed that enhancement of dentist-patient communication was a direct improvement of their satisfaction and anxiety and that formal training plays a crucial role in integrating patient-centered communication into clinical practice [9, 11, 12]. Besides, as confirmed by [6] and [15], the new trends in communication, including the structured patient-centered model, do not only change the patient satisfaction but also the clinical performance.

Some non-pharmacological interventions to manage pediatric anxiety such as the tell-show-do methodology, distraction methods, and intervention by child life specialists have been experimented with mixed levels of success [5]. Additionally, early, supportive communication techniques are associated with quantifiable decreases in anxiety levels as reported by children and as assessed by observers, according to [8] and [7]. These results are consistent with more general behavioral management research that emphasizes communication as the cornerstone of pediatric patient relaxation.

Innovations like digital interactive narratives for anxiety prevention, human-centered design for sedation safety, and teledentistry for remote assessment reflect the field's increasing focus on communication-centered solutions, even outside of direct clinical encounters [7]. Collectively, these approaches underscore that communication training is not optional but integral to pediatric dental care.

Few studies have directly evaluated the impact of dental assistants' communication training on lowering pediatric dental anxiety, despite a wealth of evidence demonstrating the value of communication. There is a significant knowledge gap regarding the assistant's role because the majority of research has concentrated on dentists [13, 14]. In order to close this gap, the current study assesses the effects of structured dental assistant training on parental satisfaction and child anxiety levels during pediatric dental visits.

METHODOLOGY:

3.1Data Collection

This study was done on a prospective data collection in dental clinics of the university in a period of three months that deals with pediatric dental care. The first was 480 consecutive dental experiences with children between the age of 4 and 12 years. When the inclusion and exclusion criteria had been applied, 72 encounters (15.0%) were dropped because of insufficient data, resulting in a sample of 408 encounters (85.0) to be analyzed.

The study group was divided into two similar-sized groups of participants. The number of encounters in the intervention group was 206 (50.5%), and dental assistants participated in the study were trained in patient-centered communication; the number of

encounters in the control group was 202 (49.5%).

There were three complementary sources that were used to gather information. First, self report of anxiety in children was assessed with the help of a modified version of the Child Dental Anxiety Scale (MCDAS) at the start and the end of the visit. Second, the parental anxiety was measured on a standardized visual analog scale that was used after and before the appointment. Third, observer-rated anxiety was measured by an independent rater with the help of Venham Anxiety and Behavior Rating Scale. Moreover, physiological data including heart rate were also obtained in 180 encounters (36.5%), and parental satisfaction was also recorded at the conclusion of the visit through a three-point Likert scale. In order to achieve quality, 10 percent of all encounters (n=48) were audiotaped to be evaluated later on the fidelity. Figure 1 shows the process by which participants were selected and a final sample was allocated.

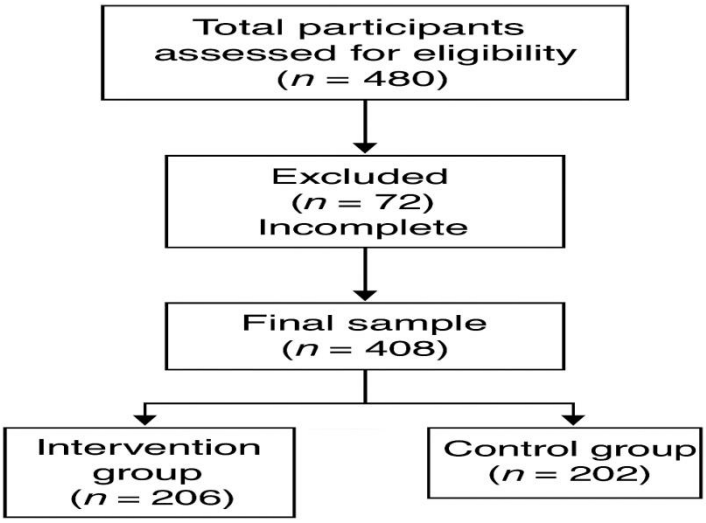

Figure 1: PRISMA flow diagram showing the study's final sample allocation, exclusions, and participant recruitment.

3.2 Process

In order to compare interactions between trained and untrained dental assistants, the study was carried out in two parallel phases. The intervention group's assistants underwent a structured training program in patient-centered communication prior to the start of data collection. The training covered verbal reassurance, active listening, using child-friendly language, and non-verbal supportive techniques in three 90-minute sessions spread over two weeks. Role-play demonstrations and comments from pediatric dentistry experts encouraged fidelity. The structured training framework offered to dental assistants is depicted in Figure 2, which starts with a pre-training evaluation and moves on to modules on reassurance, empathy, and listening. The framework also included role-playing with kids, and it ended with the use of acquired skills in actual clinical situations.

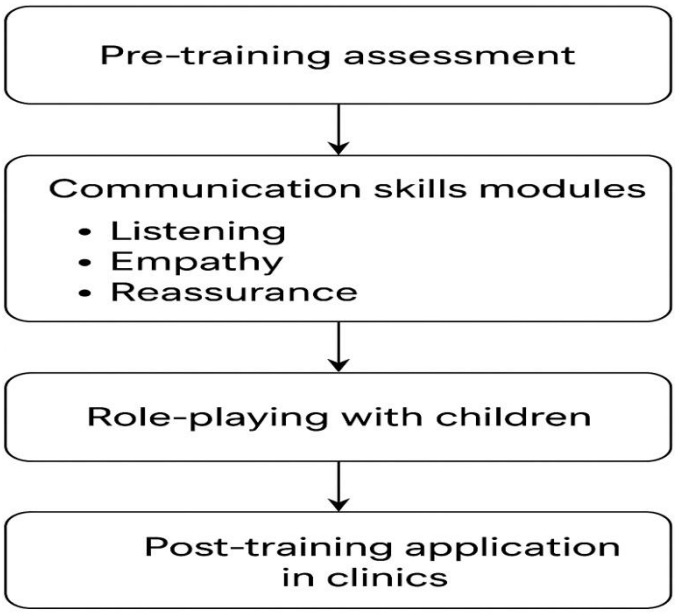

Figure 2: Dental assistant training that emphasizes the order of pre-training evaluation, communication courses, role-playing, and clinical application.

Real-time dental encounter observations were made during the clinical phase. Prior to participation, written informed consent was obtained from the parents of the children who were approached in the waiting area. Prior to beginning treatment, baseline data on parental and child anxiety were gathered. The same tools were used once more to measure changes after the clinical encounter. During the visit, observer-rated anxiety was independently recorded, and a randomly chosen subsample's heart rate was non-invasively monitored.

Parents were asked to fill out a satisfaction survey at the conclusion of each visit, which assessed how they felt about the dental assistant's communication style. Ten percent of interactions were audio-recorded and then examined by two separate raters to ensure compliance with patient-centered communication components in order to preserve reliability. The acceptable threshold for inter-rater reliability was surpassed (ICC > 0.75).

3.3 Data Analysis

For statistical analysis, all data were coded and imported into SPSS version 28.0 (IBM Corp., Armonk, NY, USA). First, demographic factors like age, sex, and prior dental experiences were compiled using descriptive statistics. For continuous variables, means and standard deviations were computed, and for categorical variables, frequencies and percentages were displayed.

The Shapiro-Wilk test was used to determine whether the continuous outcomes—child anxiety scores, parental anxiety, observer ratings, and heart rate—were normal. Parametric techniques were used as long as the normalcy assumptions were satisfied. Pre- and post-visit scores within each group were compared using paired-sample t-tests, and differences between the intervention and control groups were evaluated using independent-sample t-tests. Pearson's chi-square test was used for categorical outcomes like parental satisfaction.

To ascertain the extent of the observed differences, effect sizes were computed. For continuous outcomes, Cohen's d was reported, with thresholds of 0.2, 0.5, and 0.8 denoting small, medium, and large effects, respectively. The effect strength for categorical outcomes was assessed using Cramer's V. For every test, a significance level of $p < 0.05$ was used. A second researcher independently re-coded 10% of the dataset to guarantee robustness, and the agreement was higher than 95%. Pairwise deletion was used to handle the small amount of missing data (less than 5%).

RESULTS

4.1 Features of the Population

After removing incomplete records, 408 cases (85.0%) of the 480 targeted pediatric encounters were included in the final analysis. The control group contributed 202 encounters (49.5%), whereas the intervention group contributed 206 encounters (50.5%).

Table 1: Sample Demographics (N = 408)

Variable	Intervention (n=206)	Control (n=202)	Total (N=408)	% of Total
Age (years)				
4–6	54	48	102	25.0%
7–9	92	92	184	45.1%
10–12	60	62	122	29.9%
Sex				
Male	110	102	212	52.0%
Female	96	100	196	48.0%
Previous dental visits				
None	62	60	122	29.9%
1–2	81	82	163	40.0%
≥ 3	63	60	123	30.1%

Age ($p = 0.62$), sex ($p = 0.58$), and prior dental experience ($p = 0.49$) did not show statistically significant baseline differences between groups.

4.2 Main Result: Dental Anxiety in Children

The groups' mean anxiety scores at baseline were comparable (11.2 ± 2.4 in the intervention arm vs. 11.0 ± 2.5 in the control arm; $p = 0.58$). Children in the intervention group demonstrated a significant decrease to 8.1 ± 2.1 after the intervention, while the control group's was 10.2 ± 2.3.

Table 2: Mean ± SD for Child Anxiety Scores

Group	Baseline	Post-Intervention	Mean Reduction	% Reduction
Intervention (n=206)	11.2 ± 2.4	8.1 ± 2.1	-3.1	27.7%
Control (n=202)	11.0 ± 2.5	10.2 ± 2.3	-0.8	7.3%

With a large effect size (Cohen's $d = 0.85$), the between-group difference was statistically significant ($p < 0.001$). The mean child dental anxiety scores before and after the intervention are contrasted in Figure 3. In line with the statistical results shown in Table 2, children in the intervention group showed a significant decrease in anxiety levels when compared to those in

the control group.

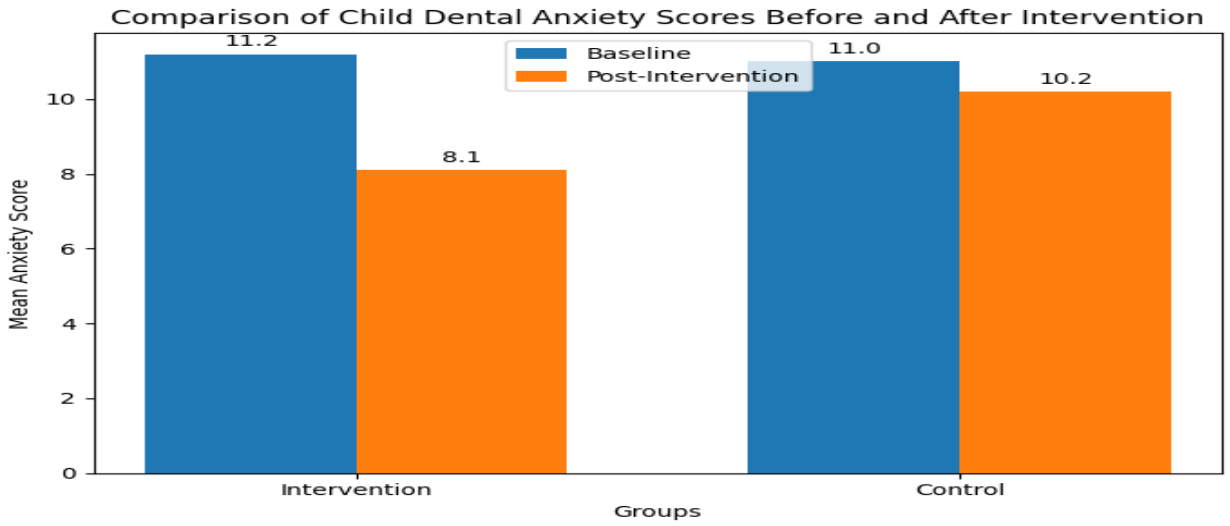

Figure 3: Mean dental anxiety scores for children before and after the intervention are compared. When compared to the control group, children in the intervention group displayed a significantly higher reduction ($p < 0.001$).

4.3 Secondary Results

Anxiety in Parents

In the intervention group, parental anxiety dropped by 11.6%, from 48.1 ± 11.2 to 42.5 ± 10.8. Conversely, the control group experienced a negligible 2.1% decrease (from 47.8 ± 10.9 to 46.8 ± 11.0). There was a significant difference between the groups ($p = 0.002$). Anxiety Judged by Observers Children in the intervention group had a mean score of 35.2 ± 8.5, which was 21.2% lower than the control group's 44.7 ± 9.1 ($p < 0.001$), according to observer ratings.

Table 3: Anxiety Perceived by Parents and Observers

Outcome	Intervention	Control	% Difference	p-value
Parental anxiety (Mean ± SD)	42.5 ± 10.8	46.8 ± 11.0	-11.6% vs -2.1%	0.002
Observer-rated anxiety (Mean ± SD)	35.2 ± 8.5	44.7 ± 9.1	-21.2%	<0.001

4.4 Heart Rate-Based Physiological Anxiety

180 encounters (36.5%) had heart rate data collected. The intervention group's mean heart rate was 5.8% lower than the control group's, with an average heart rate of 89.3 ± 7.4 bpm compared to 94.8 ± 8.1 bpm ($p = 0.004$).

4.5 Contentment of Parents

86.4% of parents in the intervention arm rated communication as "highly satisfactory," compared to 61.4% in the control group, indicating a significant increase in parental satisfaction. Compared to 8.4% in the control group, only 2.4% of parents in the intervention group expressed dissatisfaction ($\chi^2 = 21.8$, $p < 0.001$).

Table 4: Satisfaction Reports from Parents

Satisfaction Level	Intervention (n=206)	Control (n=202)	% Difference
Highly satisfactory	178 (86.4%)	124 (61.4%)	+25.0%
Moderately satisfactory	23 (11.2%)	61 (30.2%)	-19.0%
Not satisfactory	5 (2.4%)	17 (8.4%)	-6.0%

A scatter plot, which uses a subsample of n=100 rather than the entire sample, was created in Figure 4 to further investigate the connection between decreases in child anxiety and parental satisfaction. The plot shows a positive correlation, meaning that higher parental satisfaction levels (n = 100) were linked to larger anxiety reductions.

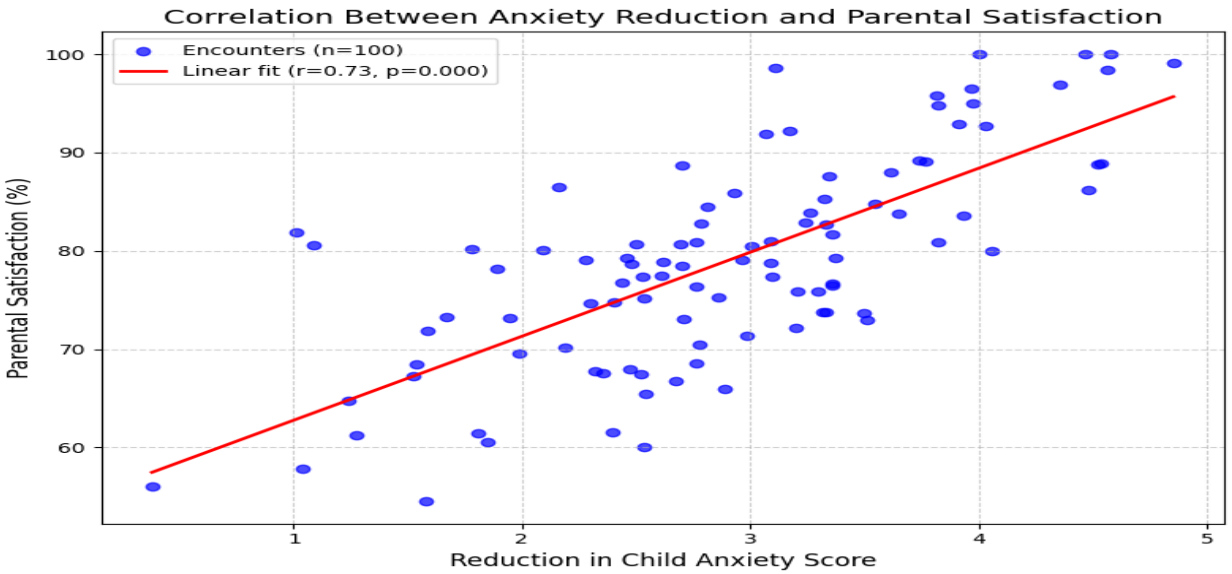

Figure 4: A scatter plot showing the relationship between parental satisfaction levels and decreases in dental anxiety in children (n = 100). Higher satisfaction ratings were consistently linked to larger drops in anxiety scores.

4.6 Implementation Fidelity

High fidelity in the intervention group was confirmed by audio-recorded encounters (n = 48, 10% of the total), with 83% adherence to patient-centered communication elements surpassing the 80% threshold. By contrast, only 18% of assistants in the control group used these elements on their own. For fidelity ratings, inter-rater reliability was satisfactory (ICC = 0.78).

DISCUSSION

The results of this research proved that patient-centered communication training in dental assistants has a significant effect on the decrease of anxiety level among children during the treatment in opposition to the control group. This is in line with the growing body of research showing how crucial communication is to improving patient comfort and satisfaction in the dental care setting [15, 16].

The resulting reduction in anxiety among the intervention group participants reflects the broader patient-centered dental care principle, which places greater emphasis on clinical outcomes than on the patient's feelings. The importance of staff–patient interaction is supported by other qualitative studies that have highlighted the same point: children and families have a better experience when dental care is communicated in an inclusive and empathetic manner [17, 18].

Such findings indicate that it is possible to make significant changes in the psychological reactions of children to visiting the dentist by training dental assistants according to such practices.

We also find our results to be consistent with those studies that have investigated the specific anxiety management techniques in pediatric dentistry. For example, research on behavioral interventions including the tell–show–do technique, audio distraction, and audiovisual distraction showed that they were helpful and effective in alleviating anxiety in young patients [19, 20]. The current research adds to this evidence, since it demonstrates that communication-based strategies, albeit lacking technological distraction tools, can yield similar positive effects. Training interventions are also a means of achieving sustainable and low-cost interventions that can be incorporated into daily practice by dental staff.

The importance of dental staff contribution in the management of patients is increasingly recognized in contemporary dentistry. The role of dental assistants as a way of improving quality of care was examined in a systematic review, and it found that they can perform better care so long as they are equipped with systematic approaches to mobilize them [21]. We have more than that and demonstrate that training focused on communication does not only enhance the quality of care, but also directly affects such patient outcomes as reduced anxiety. This justifies the expansion of the professional development of dental assistants into patient-based competencies, besides the technical assistance.

The findings are also put into perspective by the pediatric patients who identify with dental experience. It is also discovered that children experience anxiousness that is linked to their perception of the behavior and quality of interaction with the provider [22]. Similarly, previous research observed that the reduction of fear and anxiety in dental practices is the most important factor in the overall impact on the oral health practice in the long run [23]. As demonstrated in the current research, communication training was instrumental in mitigating these concerns, which is why its efficacy as a preventive or curative intervention should be regarded as critical.

The adoption of new forms of communication is another element to consider. Some studies stated that digital interactive tools could be potentially promising in preventing dental anxiety, and others wrote about the possibility of teledentistry to establish a

patient-centered conversation within the virtual space [24, 25]. As far as the current research was restricted to a face-to-face visit, the training principles could be applied to these novel modalities. This opens up new possibilities of future research, particularly in combination care.

Theoretically, the findings align with models suggesting patient-centered dental care as a crucial value in practice [26]. The research provides empirical data showing how such conceptual frameworks can be transformed into actual strategies by integrating communication training into the workflow of dental assistants. Moreover, dental assistants may bring efficiency to care-team operations, enabling dentists to carry out their technical duties without compromising patient interaction. Despite the positive outcomes, there are some limitations that must be mentioned. The study was conducted in a small clinical setting that may restrict extrapolation of the results. There was also no long-term follow-up to measure the effects, and anxiety was assessed only in the short term. Future studies should investigate how communication-based interventions can be sustained and applied across diverse dental care contexts.

To sum up, the research indicated that dental assistants may be able to reduce anxiety levels during pediatric dental examinations through patient-centered communication training. The findings confirm the demand to include structured training in the professional advancement of dental assistants and emphasize the significance of communication in patient care [27, 28]. This type of training can transform the pediatric dentistry experience, as it can address both clinical and emotional needs, and this may lead to improved health outcomes and greater patient and family satisfaction.

CONCLUSION

This study demonstrated that patient-centered communication training for dental assistants is a significant and measurable improvement that can lessen anxiety during pediatric dental visits. In both self-reported or observer-rated anxiety measures and physiological indicators of anxiety (heart rate), no significant differences were found between children who were followed by trained assistants and those who were followed by untrained ones. Reduced anxiety and greater satisfaction with the care received were also characteristics of parental outcomes, demonstrating the intervention's broader family-centered effects.

The findings show that dental assistants, whose involvement is crucial in determining how a child experiences dentistry, can effectively enhance communication, which is not just the responsibility of dentists. Empathy, active listening, and kid-friendly language were the main focuses of the training program, which was not only practical but also successful in meeting fidelity levels that were significantly higher than what was considered acceptable.

Dental professionals can provide children with high-quality care, build trust, and reduce treatment-related anxiety and resistance by introducing structured communication techniques with the help of dental assistants. Future research is required to determine whether these effects are sustainable over the long term and to look into the possibility of including communication training in standard dental assistant training programs in a variety of clinical settings.

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