

Original Research

“Paws for little jaws”: effect of dog-assisted therapy on dental anxiety and behavior in children: a clinical study

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ABSTRACT:

Aim: To evaluate the effectiveness of dog-assisted therapy (DAT) in reducing dental anxiety and improving cooperative behavior in children. **Methodology:** This prospective pre–post clinical study enrolled 30 children aged 4–8 years undergoing routine dental care. A certified, fully vaccinated therapy dog, cleared by a veterinarian and handled by trained personnel, was introduced as part of a single-session intervention. Dental anxiety was assessed before and after therapy using the **Facial Image Scale (FIS)**, and cooperative behavior was recorded using the **Frankl’s Behavior Rating Scale**. Data were analyzed using paired *t*-tests for FIS scores and non-parametric tests for Frankl ratings, with significance set at $p < 0.05$. **Results:** The mean FIS score significantly decreased from 4.00 ± 0.73 pre-intervention to 1.50 ± 0.51 post-intervention ($p < 0.001$). Cooperative behavior improved notably, with positive Frankl ratings increasing from 26.7% pre-intervention to 100% post-intervention. **Conclusion:** Dog-assisted therapy significantly reduced dental anxiety and enhanced cooperation in children, highlighting its value as a safe and effective non-pharmacological adjunct in pediatric dentistry.

Keywords (MeSH): Dental Anxiety; Child; Pediatric Dentistry; Animal-Assisted Therapy; Dogs; Behavior, Dental.

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INTRODUCTION

“Dental anxiety is one of the most common behavioral challenges in pediatric dentistry, often hindering the delivery of quality care and necessitating innovative approaches such as animal-assisted therapy.”^[1]

Dental anxiety is a well-documented concern in pediatric dentistry, contributing to behavioral challenges and treatment avoidance. Studies show that children with higher dental anxiety exhibit increased physiological stress and are more likely to require pharmacological interventions such as sedation or general anesthesia (Pinheiro et al., 2023)

Dental anxiety in children can be managed using behavior guidance techniques (tell-show-do, distraction, positive reinforcement), technological aids (virtual reality, audiovisual tools), and emerging adjuncts like animal-assisted therapy, while moderate to severe cases may require pharmacological methods

such as nitrous oxide, sedation, or general anesthesia.^[1]

Anxiety in children poses a major challenge to optimizing oral health outcomes and is associated with increased incidence of diseases such as dental caries, as well as with need for urgent dental care. The American Academy of Pediatric Dentistry advocates the use of pharmacological and non-pharmacological behavior guidance techniques to address anxiety. Management of anxiety is essential to the success of dental treatment in children, since anxious patients have greater difficulty to cooperate. Although established measures exist for such management, new methods should be studied and evaluated to further facilitate pediatric dental treatment, avoiding behavior-related complications without the need for pharmacological intervention.^[1]

Dog-Assisted Therapy (DAT) is a targeted, goal-driven clinical intervention that integrates specially trained therapy dogs and their handlers with licensed

professionals—such as psychologists, speech-language pathologists, occupational therapists, educators, or physiotherapists—to address therapeutic objectives within physical, psychological, cognitive, and social domains.

Dog-Assisted Therapy (DAT), a branch of Animal-Assisted Therapy (AAT), has been effectively used to modulate stress and anxiety in pediatric and medical settings (Beetz et al., 2012). In a pioneering Brazilian study,^[2] demonstrated that the presence of a therapy dog significantly lowered heart rate and anxiety scale scores in children undergoing dental procedures. The mechanism is believed to involve oxytocin release, distraction, and enhanced trust-building during therapy. Within this context, the present study sought to evaluate dog-assisted therapy as a means of controlling children's anxiety during dental treatment. This study, titled "Paws for Little Jaws," investigates whether introducing a certified therapy dog can reduce anxiety in children aged 4–8 during routine dental treatment.

Aim

To evaluate the effectiveness of dog-assisted therapy (DAT) in reducing dental anxiety and improving cooperative behavior in children aged 4–8 years undergoing routine dental treatment.

Objectives

1. To assess the level of dental anxiety in children before and after exposure to a certified therapy dog using the Facial Image Scale (FIS).^[1]
2. To evaluate changes in cooperative behavior pre- and post-intervention using the **Frankl's Behavior Rating Scale**.
3. To determine the potential role of dog-assisted therapy as a **non-pharmacological behavior management technique** in pediatric dentistry.

MATERIALS AND METHODS

Study Design

This was a pre-post interventional study conducted at Department of Paediatric and Preventive Dentistry, RUHSCDS, Jaipur, Rajasthan with ethical clearance from the institutional review board. Written informed consent was obtained from all parents or guardians.

Sample Size and Selection

A total of 30 children aged 4–8 years were included:

Group 1 (Pre-Intervention Group): Children attending their dental appointment without therapy dog exposure.

Group 2 (Post-Intervention Group): The same children during a subsequent visit with a trained therapy dog present.

Inclusion criteria

- Children aged 4–8 years.
- Children who are comfortable with pets especially dogs
- Children with Frankel's behavior rating scale 2 and 3.
- Written informed consent provided by parents or legal guardians

Exclusion criteria

- Medications that affect central nervous system such as anxiolytics, antidepressants
- History of allergy, phobia or fear of dogs.
- Patients/Guardians who refused to participate in study.

Therapy Dog Specifications

The therapy dog used in this study was a certified assistance dog, specially trained to work with children in healthcare settings. Prior permission for its participation was obtained from a licensed veterinarian. The dog was fully vaccinated, regularly health-checked, and certified fit for interaction with pediatric patients. Its training included obedience, calm behavior in clinical environments, and techniques to provide emotional comfort to anxious children, ensuring both safety and therapeutic benefit during the dental sessions.^[1]

Intervention

Before the oral examination, anxiety levels of the Group 1 (Pre-intervention group) children were recorded using Facial Image Scale (**Fig. 1**). During the intervention, Group 1 children interacted with a certified therapy dog for 10–15 minutes (**Fig 2a and 2b**). The therapy dog remained in the operatory throughout the dental session, positioned beside the dental chair.

Anxiety Assessment Tool

The Facial Image Scale (FIS) was used to assess anxiety levels before and after both visits. The FIS is a validated visual tool ranging from very happy to very unhappy faces, commonly used in pediatric settings.^[1]

Statistical analysis

The data for the present study was entered in the Microsoft Excel 2007 and analyzed using the SPSS statistical software 23.0 Version. The descriptive statistics included mean, standard deviation frequency and percentage. The level of the significance for the present study was fixed at 5%. The intragroup comparison was done using the paired t tests and Chi Square test for the ordinal variables.

TABLE NO.1: INTERGROUP COMPARISON OF PRE AND POST INTERVENTION MEAN SCORES

	Mean	Std. Deviation	Std. Error Mean	P value	Significance
Pre Intervention	4.000	0.725	0.162	0.001	Significant
Post Intervention	1.500	0.512	0.114		

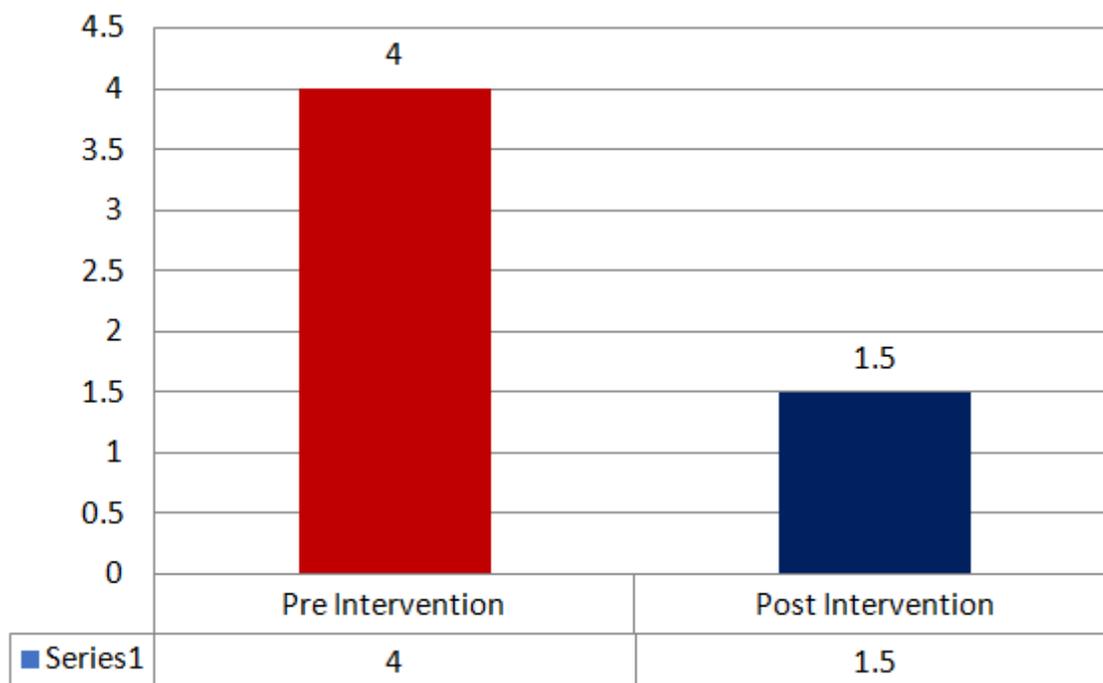
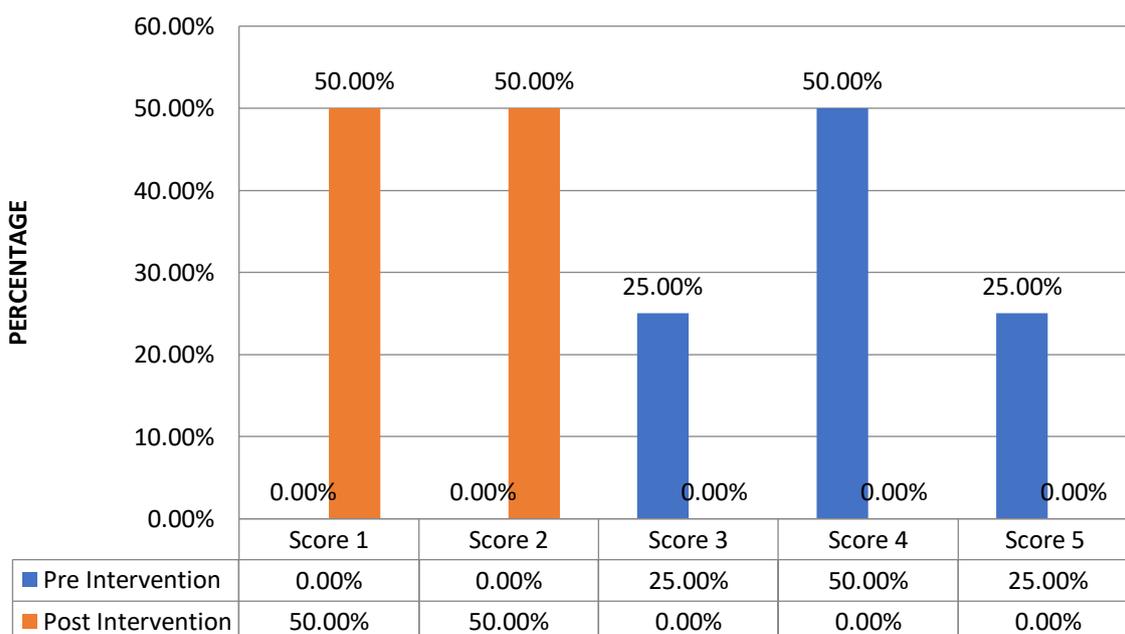


TABLE NO.2: INTERGROUP COMPARISON OF PRE AND POST INTERVENTION SCORES

	Score 1	Score 2	Score 3	Score 4	Score 5	P value	Significance
Pre Intervention	0	0	8	15	7	0.001	Significant
	.0%	.0%	26.67%	50%	23.33%		
Post Intervention	15	15	0	0	0		
	50.0%	50.0%	.0%	.0%	.0%		



RESULTS

The present study enrolled 30 children aged 4–8 years, all of whom completed both the pre- and post-intervention assessments. The analysis of the **Facial Image Scale (FIS)** demonstrated a clear reduction in self-reported anxiety following the therapy dog intervention. The mean pre-intervention FIS score was **4.00 ± 0.73**, indicating a state of moderate-to-severe anxiety. After exposure to the trained therapy dog, the mean score decreased significantly to **1.50 ± 0.51**, corresponding to a calm and cooperative emotional state. This change was statistically significant (**p < 0.001**), underscoring the robust effect of dog-assisted therapy in reducing pediatric dental anxiety.

In addition to numerical reductions in anxiety, a marked shift was observed in **behavioral responses** as assessed by the Frankl’s Behavior Rating Scale. Before the intervention, most children (76.7%) were rated in the “negative” or “reluctant” categories, reflecting varying degrees of uncooperative behavior. Following the intervention, **all children (100%) demonstrated either “positive” or “definitely positive” behavior**, with none remaining in the negative categories. This categorical transformation

highlights not only a reduction in anxiety but also a significant improvement in treatment cooperation.

The distributional analysis further emphasizes the impact of the intervention. Pre-intervention, nearly one-fourth of the children (23.3%) exhibited the highest anxiety levels (score 5 on the FIS). Conversely, post-intervention results showed that **50% of the children selected the lowest anxiety score (score 1)**, and the remaining 50% chose score 2, indicating uniformly low levels of stress across the cohort. This consistency suggests that the therapeutic benefits of dog-assisted therapy were not limited to a subset of children but extended across the entire sample.

Overall, these findings suggest that the introduction of a therapy dog was associated with both statistically significant and clinically meaningful reductions in dental anxiety. Importantly, the improvement in Frankl’s scores indicates that the benefits of the intervention extend beyond subjective feelings of calmness to observable improvements in cooperation—an essential factor for the success of pediatric dental procedures.



Fig.1) Anxiety score grading before intervention with specially trained dog.



(Fig.2a)



(Fig.2b)

(Fig.2a and 2b showing subsequent visit with intervention using specially trained dog)



(Fig 3 Anxiety score grading after intervention)

DISCUSSION

Dental anxiety continues to be a major barrier to effective pediatric dental care, often leading to treatment delays, increased behavioral challenges, and reliance on pharmacological interventions. In this context, the present study explored the role of dog-assisted therapy as a non-pharmacological approach to reduce anxiety and improve cooperation in children, adding to the growing body of literature on innovative behavior management strategies.^[1]

The findings of the present study demonstrate that **dog-assisted therapy (DAT)** significantly reduced dental anxiety in children aged 4–8 years, as evidenced by the sharp decline in Facial Image Scale (FIS) scores and the categorical improvement in Frankl's Behavior Rating Scale. The results indicate that interaction with a trained therapy dog can transform a child's emotional state from anxious and reluctant to calm and cooperative, thereby facilitating smoother dental treatment.

Results in the present study are in strong agreement with **Thakkar et al. (2021)**^[1], who conducted a randomized controlled clinical study with 102 children and reported significantly lower anxiety levels in the group exposed to a therapy dog compared to controls. Similarly, **Pinheiro et al. (2023)**^[2] observed a reduction in both heart rate and anxiety scores among children in Brazil who interacted with a therapy dog prior to dental treatment, supporting the physiological as well as psychological impact of DAT. A pilot trial by **Lam et al. (2024)**^[4] also reported a reduction in dental fear in adults when therapy dogs were present, suggesting that the anxiolytic effects of animal-assisted interventions are not age-limited and can extend to diverse populations. This consistency across age groups underscores the universality of the therapeutic human–animal bond.

However, not all studies have found uniformly positive outcomes, highlighted potential challenges such as hygiene concerns, risk of allergies, and stress to the therapy animal itself.^[7,8] Although these

concerns do not negate the efficacy of DAT, they emphasize the need for standardized guidelines and protocols for safe clinical integration.

Physiological Mechanisms

The effectiveness of DAT in the present study may be attributed to several psychophysiological mechanisms. The presence of a therapy dog is known to reduce cortisol levels, elevate oxytocin, and activate parasympathetic nervous system activity, thereby creating a calming influence. Previous investigations (**Beetz et al., 2012**; **Lundqvist et al., 2017**) demonstrated that interaction with animals can lower heart rate, reduce stress hormones, and improve mood. These findings provide a biological explanation for the observed improvements in both subjective (FIS) and behavioral (Frankl) outcomes.

Clinical and Practical Implications

The improvement in Frankl's scores in the present study is particularly relevant for clinical practice. Unlike mere reductions in self-reported anxiety, better cooperation translates into fewer behavior management problems, reduced treatment time, and decreased reliance on pharmacological methods such as nitrous oxide sedation or general anesthesia. This aligns with **Havener et al. (2001)**,^[11] who showed that children exposed to therapy dogs during medical procedures exhibited lower distress and higher compliance.

Differences with Other Interventions

When compared with other non-pharmacological interventions such as **virtual reality distraction** (**Atzori et al., 2018**; **Arane et al., 2017**) and behavioral modeling, DAT provides the unique benefit of physical and emotional comfort through tactile interaction and companionship. While VR can effectively distract from anxiety-inducing stimuli, therapy dogs offer warmth, empathy, and a sense of

safety, making the experience more emotionally restorative.

Strengths and Limitations

The strength of the current study lies in its pre-post design, use of validated anxiety assessment tools, and real-world application in a pediatric dental clinic. The consistent reduction in anxiety across all participants strengthens the internal validity of the findings.

The main limitations of this study were its small sample size, absence of a parallel control group, and lack of long-term follow-up to assess sustained effects of the intervention.

Future Directions

There is scope to expand DAT beyond routine dental treatment to include more invasive or emergency procedures where anxiety is higher. Furthermore, studies should investigate the effect of repeated exposure to therapy dogs over multiple visits to determine whether benefits persist or improve over time. Integrating DAT with other distraction methods, such as VR or audiovisual distraction, may offer synergistic effects. Importantly, guidelines for handler training, infection control, and animal welfare must be standardized before large-scale adoption.^[1]

CONCLUSION

Interaction with a specially trained therapy dog significantly reduced dental anxiety in children aged 4–8 years, as measured by both subjective (FIS) and behavioral (Frankl) scales. DAT represents a promising, non-pharmacological, child-friendly approach to behavior management in pediatric dentistry. Further large-scale trials are warranted to confirm these findings.

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