

# A bite out of anxiety: Evaluation of animal-assisted activity on anxiety in children attending a pediatric dental outpatient unit

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## ABSTRACT

**Background:** Anxiety control has been one of the key factors that shows that success of a pediatric dental practice. Animal-Assisted therapy has shown to have many health benefits, which has brought the animal species closer to our homes with an establishment of a relationship. **Aims and Objectives:** The purpose of this study was to compare Anxiety levels of patients scheduled to visit a Private private Ppediatric dDental Hhealth- Ccare Ffacility in Chennai and Ccompare the levels when exposed to animal-assisted activityAAA at the waiting area and in the oOperating area. This study being a first of its kind in the Dental dental Environment environment consisted of 20 children (9 Malemales, 11 Femalefemales), aged 4–11 years, attending a private dental care facility in Chennai. **Results:** Results showed that a 15- min exposure in the waiting area has reduced the level of anxiety and also showed no increase in anxiety among the subjectsparticipants. **Conclusion:** Thus, Pet pet Ttherapy has shown to be a promising method of Anxiety anxiety control, a key to a successful dental practice.

**KEYWORDS:** Animal-assisted therapies, anxiety, dental anxiety, pet therapy, Test Anxiety Scale

## Introduction

The term domestication comes from “domus,” the home, meaning that humans have brought animal species close to their home with mostly utilitarian goals and establishment of a relationship. The relationship is bidirectional with each partners developing knowledge on how the other will react.<sup>[1]</sup>

Wilson’s (1984) biophilia hypothesis is based on the premise that our attachment to an interest in animals stems from the strong possibility that human survival was partly dependent on signals from animals in the

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environment indicating safety or threat. The biophilia hypothesis suggests that now, if we see animals at rest or in a peaceful state, this may signal to us safety, security, and feelings of well-being which, in turn, may trigger a state where personal change and healing are possible.<sup>[2]</sup> These therapeutic modalities that use animals for improving the overall cognitive/social functioning of humans are called animal-assisted interventions (AAIs),<sup>[3]</sup> where the American Veterinary Medical Association<sup>[4]</sup> has classified them into three categories:

- Animal-assisted activities (AAAs) – informal activities that involve human–animal interactions,

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promoting socialization, motivation, education, recreation, and other therapeutic benefits

- Animal-assisted therapy (AAT) - therapeutic modality to improve human functioning in patients with acute or chronic diseases
- Service animal programs - increase autonomy of persons with disabilities.

AAT is an applied science using animals to solve a human problem. It is an interdisciplinary approach using animals as an adjunct to other therapies.<sup>[5]</sup> The use of animals has been a practice for a long time in hospitals such as one reporting the use of a golden retriever for >6 months in a hospital bringing smiles to the faces of patients and creation of a pet therapy program in the hospital itself.<sup>[6,7]</sup> This study aimed to evaluate the feasibility of incorporating AAA in the pediatric dental facility. The objective was to compare anxiety levels of patients scheduled to visit a private pediatric dental health-care facility in Chennai and compare the levels when exposed to AAA at the waiting area and in the operating area.

## Materials and Methods

The study was designed according to studies by Barker *et al.*<sup>[8]</sup> and Vagnoli *et al.*<sup>[9]</sup> The participants consisted of 20 children (9 males, 11 females), aged 4–11 years, attending a private dental care facility in Chennai who were willing to participate in the study along with their parent’s consent. Although literature has been promoting the use in children with disabilities,<sup>[10]</sup> this study being the first of its kind in the dental facility has been restricted to children without disability. Anxiety was recorded with questionnaires, using a modified pictorial scale (RMS Pictorial Scale) by Shetty *et al.*,<sup>[11]</sup> a newer and easier method for recording child anxiety and a modification in this study being parental perception of the same. The 20 children having their first dental visit or those who did not attend an exclusive pediatric dental care facility were included in the study, with the age group of 4–11 years, and were medically and psychologically fit. The permission of the parents was another key factor for inclusion in the study. The anxiety was recorded as soon as the patient entered the waiting room the patient and exposed to AAA for a 15-min session [Figure 1] individually where male children were seen to choose a less hairy dog [Figure 2]. The AAA therapy was also continued in the dental unit for noninvasive therapies such as fluoride application and restorations where the therapy animal was allowed to sit on the patient’s laboratory and the results were tabulated [Table 1] after recording the anxiety nearing the completion of treatment. Trained dogs were chosen for this study and were groomed before the AAA. This study had also had taken into account that the incorporation of a therapy dog must take into account the infection

control guidelines and potential health risks.<sup>[12]</sup> Statistical analysis by Wilcoxon signed-rank test was done using SPSS (Ver. 22.0, IBM, USA), and the results were tabulated [Table 2].

## Discussion

Fear and anxiety both alerting signals are a response to danger, threat, or motivational conflict and trigger appropriate adaptive response, where anxiety is a generalized response to an unknown threat.



**Figure 1:** Introduction of the pet animal to the patient in the waiting room for a 15-min session

**Table 1: Comparison of pre and post exposure values**

Preexposure	Postexposure, n (%)				
	1	2	3	4	Total
1	3 (100.0)	0	0	0	3 (100.0)
2	0	1 (100.0)	0	0	1 (100.0)
3	4 (100.0)	0	0	0	4 (100.0)
4	2 (28.6)	5 (71.4)	0	0	7 (100.0)
5	0	1 (20.0)	3 (60.0)	1 (20.0)	5 (100.0)
Total	9 (45.0)	7 (35.0)	3 (15.0)	1 (5.0)	20 (100.0)

Preexposure (before animal therapy) and postexposure (during treatment) showed an improvement in anxiety levels in all the study participants, showing the effectiveness of animals in improving anxiety levels

**Table 2: Wilcoxon test of significance to compare the pre and post exposure ratings**

Anxiety rating	Ranks	n	Mean rank	P
Preexposure versus postexposure	Negative ranks	0	0.00	<0.001
	Positive ranks	16	8.50	
	Ties	4		

Wilcoxon signed-rank test to compare the preexposure and postexposure anxiety ratings showed that there were no children who had an increase in anxiety levels with a majority showing an decrease in anxiety levels showing that there was statistical significance ( $P < 0.001$ ) in the outcome of the anxiety control measure



**Figure 2:** Male children preferred a less hairy dog for their session of therapy

Ethologists define fear as a motivational state aroused by specific stimuli that give rise to defensive behavior or escape. Barlow has described anxiety as “a unique and coherent cognitive-affective structure within our defensive and motivational system.”<sup>[13]</sup> Despite the being advances in dental care, encountering anxiety and its management remain a challenge the pediatric dentist. Videos revealed multiple manifestations and impacts of dental fear and anxiety, including immediate physical reactions (e.g., crying, screaming, and shivering), psychological responses (e.g., worry, upset, panic, helplessness, insecurity, resentment, and hatred), and uncooperativeness in dental treatment.<sup>[14]</sup> In addition to the relatively simple techniques such as providing information, tell-show-do, and signaling, there are several psychological approaches to manage dental anxiety and fear which can be used in the clinic. These range in complexity from those that are relatively easy to carry out to others requiring specialized training.<sup>[15]</sup>

The results though are obtained from the dental environment are comparable to those obtained in other health-care environment since this is first reported study of its kind such as research in the University of California showing lower anxiety levels when compared to a control group,<sup>[16,17]</sup> and Shiloh *et al.*<sup>[18]</sup> also showed significant improvement in anxiety when petting a live animal rather than a toy, with this effect not affected by people’s attitude toward animal reduction in anxiety was also noted also in acute schizophrenic patients by Lang *et al.*<sup>[19]</sup> and Berget *et al.* (2008)<sup>[20]</sup> had also shown that exposure of psychiatric patients to farm animals where the activities included feeding and physical contact showed improvement on self-efficacy and coping ability.

There are five main impacts of dental anxiety which are classified into physiological, cognitive, behavioral, health, and social. Under these, there are a host of findings such as negative thoughts, fear and dental

anxiety featuring mostly in the form of muscular tension, crying, and aggression showing its effect on people’s lives to be wide ranging and dynamic.<sup>[21]</sup> Significant reduction in levels of cortisol that is secreted in response to stressful stimuli was also noted when children were subjected to AAI.<sup>[9]</sup> It has also been noted that there is a reduction of stress hormones, such as epinephrine and norepinephrine, as well as increases in endorphin levels.<sup>[22]</sup> Oxytocin also offers antistress effects and increases pain threshold, and oxytocin levels have been shown to increase following therapy dog visits.<sup>[23,24]</sup>

## Conclusion

The term “dentophobia,” fear of dentists, is not a new concept and children are very susceptible, most commonly friends and media being a source of bad information about health care. Pet therapy can be a great addition to practice since a key to a good pediatric practice is reduction of anxiety and controlling behavior. Although our practice has been successful in implementing pet therapy, it is important to note that there is a lack of trained dogs for use in our health-care situations, especially in India. It is not easy to just purchase a pup and go ahead with this, and we have to first select the right pup for the need as well as adopt proper training practices. Since pet therapy is in its infancy, in India, we have a lot effort since we have to first accept that they are living beings, their character depends on their family, and animals share with us the privilege of having a soul.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the children’s guardians have given their consent for their children’s images and other clinical information to be reported in the journal. The guardians understand that their children’s name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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## Conflicts of interest

There are no conflicts of interest.

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