# Parental Perceptions Toward Viewing An Animation About Dental Injections

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**Abstract**

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**Purpose**: To compare parental perceptions before and after viewing an animation demonstrating a dental injection. Parental dental fears were also compared with perceptions of their child's dental fears before viewing the animation.

**Methods**: Fifty caregivers of healthy children between 4 and 12 years old seen at a University based pediatric dental clinic were asked to assess their own and their child's dental fears by completing surveys. Surveys were completed before and after watching an animation about dental injections. The video was viewed prior to the child's dental treatment. Caregivers rated their child's fears using the Dental Subscale of the Children's Fear Survey Schedule (CFSS-DS). The CFSS-DS consists of 15 questions measuring fear-related items on a Likert scale from 1 to 5, producing a fear score out of 75 points. Caregivers rated their own fears using the Modified

Dental Anxiety Scale (MDAS) consisting of 5 questions measuring fear in dental situations, producing a fear score out of 25 points.

**Results**: Parental fears corresponded significantly with perceptions of their child's dental fears. Linear regression with robust standard errors demonstrated as CFSS scores increased 1 point, pre-intervention MDAS scores increased by 0.85 points ($p$=.03). There was also a significant decrease in MDAS scores after watching the animation ($p$=.02). Thus, parental fears decreased post-intervention. No association was found between video helpfulness and anxiety levels and other variables.

**Conclusions**: An animation about dental injections can diminish caregivers' fear regarding dental procedures. Caregivers considered a cartoon depicting a dental injection to be an acceptable behavior guidance tool for children.

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## BACKGROUND

A search on the website YouTube© for the keywords “dental injection”, “child”, and “shot” yields nearly 18,000 related videos. This number continues to grow as the internet becomes increasingly ubiquitous for acquisition of entertainment and information by the general public. The ease of accessing a wide variety of information about dental procedures can present a challenge for dentists especially when the information is inaccurate. The influences of social media can contribute to parental views on dental care. Hamzah et al. performed a qualitative study that highlighted the importance of understanding public perception by reviewing YouTube© video testimonials regarding dental fear and anxiety. They found a multitude of behavioral guidance strategies were endorsed by parents and children [1].

### *Modeling the Dental Injection*

The changing dynamic of the dentist-patient-parent relationship must be considered when adapting different behavioral guidance methods. Physical restraint techniques such as hand-over-mouth and passive restraint have grown increasingly unpopular. In contrast, although advanced pharmacological techniques such as conscious sedation and general anesthesia have increased in acceptability for managing behavior in dental treatment, the tell-show-do technique remains as the most acceptable behavior management approach for parents in the past two decades [2]. By visually and verbally reviewing the details of the dental procedure appropriate to the child’s age with the patient, the goal of tell-show-do is to mitigate fears of the unknown. Although tell-show-do has been widely adapted as a standard of care for most dental procedures, showing a pediatric patient the needle has remained a topic of controversy.

Traditionally, pediatric dentistry texts recommend hiding the needle and refraining from using the words “shot” or “needle” with the patient because it may defeat the goal of achieving cooperation and diminishing dental anxiety [3][4]. However, a few studies have shown the opposite conclusion. Modeling the dental injection can give the patient perceived control, a coping mechanism to overcome their dental fear. Weinstein et al. [5] reported that fearful children had less anxiety after viewing a video of a child receiving a dental injection compared with the control, a video about Disneyland in a school setting. Maragakis et al. [6] showed no changes in cooperative behavior among children without prior dental experience before and after viewing the needle regardless of level of fear. Instead, maternal anxiety was the primary explanation for uncooperative behavior.

***Maternal Influence on Child’s Fears***

Maternal personality traits can influence a child’s ability to cope with internal fears when provoked. A meta-analysis of 43 studies on the relationship between parental and child dental fears identified that a child’s dental anxiety is significantly impacted by parental roles and parental temperament [7]. Different mother-child dyad types have been identified based on maternal personality traits. Competent mothers tend to respond in a consistent manner and nurture their child’s independence. Aggressive and anxious mothers are likely to be inconsistent and unable to set boundaries for their child [8].

However, maternal anxiety is a single factor among many associated with dental fear. Dental fear and phobia is complex and multi-dimensional. For instance, negative emotions, pain sensitivity, child’s fear disposition, and negative information have been theorized to explain the origins of dental fear [7]. Even needle phobia does not have an overt cause. Majstorovic et al.

[9] demonstrated that fear of doctors was a significantly higher predicting factor than dental situations for high-dental anxiety children. This study also showed that needle phobia diminishes with age possibly due to cognitive maturation and the development of coping abilities in needle phobic children. During infancy, fear seems to be related to a physical stimulus by reacting to the environment. Into the elementary years between 6 to 12 years old, a child's fears develops from anticipatory thoughts based on harmful experiences such as bodily injury [10].

***Preparatory Aids for Dental Fears in Children***

More studies have investigated facilitating playful activities and therapeutic programs in the reduction of fear in children before medical procedures than dental procedures[11][12]. One study supported facilitating playful activities and therapeutic programs to reduce fear in children before medical procedures [11] but not dental procedures.

Communicating with and educating children about dental procedures can be effective during the school years. A systematic review of 16 randomized clinical trials examining the effect of preparatory aids on the anxiety of pediatric patients undergoing elective surgical procedures concluded that children at least 4 to 6 years old benefit from educational preparation to alleviate anxiety. Methods of educational preparation included coloring books, videos regarding the procedures, interactive teaching books, facility tours, and puppet shows [12]. Illustrative and interactive educational materials are especially important, not just in establishing communication between provider and patients, but in maintaining appointment compliance and follow-up in low income populations with low oral health literacy [13][14].

***Filmed Intervention***

Parents with high dental anxiety are less likely to take their child to their dental appointments than parents with low dental anxiety [15]. Parents with high dental anxiety also are more likely to have a low socioeconomic status [16] and lower oral health literacy [17].

Oral health literacy is important for litigation issues as well. Written and verbal informed consent can be tedious and confusing for parents regardless of level of education. Despite the growing acceptance of conscious sedation and general anesthesia in dentistry, parents lack understanding of the risks involved through written informed consent. A study revealed that information in video format was a more effective way of communicating informed consent [18].

Filmed intervention offers a safe and practical alternative to pharmacological management such as oral sedation and general anesthesia, especially when medical and financial issues present challenges and barriers to treatment. A randomized clinical trial by Al-Namankany et al. [19] showed that video modeling was effective in reducing anxiety in children with high dental anxiety. The majority of participants also elected the video modeling method as the alternative choice to general anesthesia for dental treatment.

More research is necessary to understand the limitations and optimal methods of using video information for dental procedures. Although helpful for children before medical procedures, little is known about incorporating play as a form of communicating information regarding dental procedures. The use of animation to model dental procedures should be investigated as an adjunct to non-pharmacological behavior guidance.

***Study Objectives***

The primary objective of this study was to compare parental anxiety levels before and after viewing an animation demonstrating a dental injection. The secondary objective was to

compare parental dental fears with perceptions of their child's dental fears before viewing the animation. We hypothesize parents who report a low level of dental fear before viewing the intervention will show no significant change in anxiety levels after viewing the intervention. Parents who report high levels of dental anxiety before viewing the intervention will show significantly lower anxiety levels after viewing the intervention. Pre-intervention anxiety levels will correlate with the anxiety levels of their children.

**METHODS**

This is a cross-sectional pilot study using a convenience sample collected within a 6 month period with 50 pairs of caregiver(s)/guardian(s) and their children. Children are patients between the ages of 4-12, recruited at a university based pediatric dental clinic at the University of Washington (UW), The Center for Pediatric Dentistry (CPD), Seattle, WA. All participants were screened to insure that they were fluent in English prior to enrollment. Patients with hearing and visual impairments, special needs, active dental treatment under general anesthesia, and who did not speak English were excluded from the study. Siblings of subjects were also excluded.

***Study Design***

Screening of established and new patients who fulfilled the inclusion criteria was performed through the dental clinic's database, AxiUm©. The caregivers of patients who met the inclusion criteria were contacted by phone and given a description of the study using a script. Caregivers who were interested in participating in the study were asked to arrive 30 minutes prior to their child's appointment.

Informed consent from the caregiver was obtained at the CPD during the patient's scheduled dental appointment by a research team member and assent was obtained from the child. Each child/caregiver pair arrived at the CPD 30 minutes prior to the child's scheduled dental appointment. After obtaining informed consent, caregivers completed the pre-intervention survey, watched the video intervention, and then completed the post-intervention survey on a tablet with headphones in the clinic lobby. Accompanying children, including the patient, were given another tablet to play video games while the participating caregiver viewed the intervention (Figure 1).

The intervention was an animated film designed by cartoonists, Charles Danziger and Aaron Bernstein titled "Injection Perfection". The video is accessible by the general public on the website, www.crunchyworld.com and on YouTube©. The eight minute long video describes the sensation of the dental injection and rehearses the dental injection procedure through the interaction of live models and cartoon characters [20].

***Data Collected***

The primary outcome was caregiver anxiety level based on fear surveys. Subjects rated their child's level of dental fears using the Dental Subscale of the Children's Fear Survey Schedule (CFSS-DS) and their own fears using the Modified Dental Anxiety Scale (MDAS). Both of these validated surveys used a 5-point Likert scale where a response rating of 5 is considered most fearful while a rating of 1 is least fearful. The items were summed up to create a 'Dental Fear Score' out of 75 points for the CFSS-DS and out of 25 points for the MDAS.

Caregivers completed additional surveys asking questions regarding the following variables: child's and caregiver's age, child's and caregiver's gender, child's and caregiver's race, child's

and caregiver's ethnicity, child's and caregiver's dental fears, child's dental experience, caregiver's dental experience, caregiver's relationship to the child, child's dental insurance, and caregiver's education (Table 1, 2, and 3). In addition, participants were asked qualitative questions pertaining to the intervention.

Patient behavior was assessed by the principal investigator or another calibrated research team member at the beginning of the dental appointment and at the time of dental injection when applicable. The research team scored the child's behavior using the Frankl Behavior Scale at the beginning of the dental appointment and during the dental injection if one was applied during treatment. A patients behavior was scored as definitely negative ("-/-") when there was an observation of the patient's refusal of treatment, forceful crying, fearfulness, or any other overt evidence of extreme negativism. A negative score("-") was defined as an observation of child's reluctance to accept treatment, uncooperative, some evidence of negative attitude but not pronounced such as appearing sullen or withdrawn. A positive score ("+") was defined a child's acceptance of treatment; cautious behavior at times; willingness to comply with the dentist, at times with reservation, but patient follows the dentist's directions cooperatively. A patients behavior was scored as definitely positive ("+/+") when it was demonstrated that a child had good rapport with the dentist, interest in the dental procedures, or laughter and enjoyment (Table 4).

The data was entered into Red Cap© software Version 6.2.5 (Vanderbilt University) and analyzed using Stata© 12.0 (College Station, TX). All data was stored on a password protected computer or in a locked file cabinet in a locked room located at the CPD.

**Data Analysis**

Descriptive statistics (means, standard deviations, counts, and percentages) were calculated for all variables. A paired t-test was used to evaluate the association between pre-intervention and post-intervention survey MDAS scores overall and by individual components. The relationship between caregiver pre-intervention MDAS score and the child's CFSS-DS score was analyzed using linear regression. Fisher's Exact test was used to compare caregiver's and child's categorical demographic variables and helpfulness of the video for their children. Two sample t-tests were used to evaluate the relationship between the caregiver finding the video helpful for children compared to caregiver's and child's continuous demographic variables. Wilcoxon rank-sum test evaluated associations between video helpfulness for children versus pre-intervention caregiver's MDAS scores, post-intervention caregiver's MDAS scores, and child's CFSS-DS scores. The significance level was set to 0.05 for all tests.

**RESULTS**

***Quantitative Data***

More female (80%) than male (20%) caregivers participated in this study. Caregivers consisted of mostly White, non-Hispanic mothers (include percent non-Hispanic White mothers). The majority of the caregiver group completed some college or vocational training (30%) or 4 year college degree (22%). Public insurance and Medicaid was the predominant child's dental insurance accounting for 80% of the group. Most of the children were non-Hispanic (76%) and White (24%) (Tables 1 and 2). Most caregivers (60%) and children (92%) experienced a dental appointment within the past year for exam, cleaning, and treatment including fillings (Tables 3 and 4).

Caregivers perceived their children to be most fearful towards the dentist drilling and injections and least fearful to people in white uniforms and having to open the mouth (Figure 2). Twenty-two children out of 50 received a dental injection during the dental appointment. Within the dental injection group, 80% had a Frankl positive (+) or definitely positive (+/+) rating. Only 21% of the children had a Frankl score of negative ("–") or definitely negative ("-/-") (Table 4). Parental fears corresponded significantly with perceptions of their child's dental fears. Linear regression with robust standard errors showed that as CFSS-DS scores increased 1 point, pre-intervention MDAS scores increased by 0.85 points ($p$=.03) (Table 5). There was also a significant decrease in MDAS scores after watching the animation ($p$=.02). Mean caregiver anxiety levels decreased from 10.0 (SD = 4.2) pre-intervention to 8.9 (SD = 3.5) post-intervention (Table 6).

However, when comparing associations between demographic variables and helpfulness of the video for children using Fisher's Exact test, no significant associations were found (Tables 7 and 8). In addition, no significant associations were found between demographic variables and caregiver and child anxiety levels using Wilcoxon rank-sum test (Table 9).

***Qualitative Data***

Two investigators reviewed the qualitative questions and determined 6 broad negative themes (length of video, not accurate, not age appropriate, disliked the animation, disliked the host, too much information) and four broad positive themes (helpful information, coping strategies, liked the animation, liked the child model) across the group (Table 10).

The qualitative responses gave more insight into how the group felt about the intervention.

Eight caregivers thought the cartoon would not be helpful for their child before the dental procedure claiming that the video was too long, not age-appropriate, confusing and not representational of the true dental experience, or demonstrated too much information or detail (Table 10). Seven caregivers from the group reported that the video intervention was too long but praised the video for incorporating a human child. Caregivers of a 4 year old and 7 year old child suggested an older target audience would be more appropriate. However, these same parents liked that the video was animated. One grandparent of an 8 year old girl commented that the video "may help but I think kids won't stop fearing injections" and that she did not think the video would help her grandchild because "my granddaughter is too afraid of shots". Another stated "In some ways, talking about the procedures made me a little more anxious" and "I would still prefer that she not see the needle".

Common positive themes were also identified by the remaining 42 caregivers who felt the video would have helped their child before the dental procedure (Tables 10). Many identified that that the video was informative and liked the incorporation of a child model interacting with the animated characters. One mother remarked, "I found the tools to cope with anxiety helpful. The cartoons, songs would reduce the anxiety and normalize the experience. He would also benefit from using the tools such as counting to reduce his anxiety. I appreciated the explanation and purpose of the injection. Understanding how long the needle is and how long it takes was useful." Other parents in support of the video used adjectives and phrases such as "calming", "relaxing", "comfort", "less anxiety", and "easy to understand". Although 5 caregivers preferred the needle to be hidden, another 5 caregivers positively remarked about the details of the injection process, while the remainder of the group did not specifically

comment on the injection at all. Many parents did not like the host, commenting particularly on the awkward direction of his glance. One caregiver was confused about the host's role as being dentist versus parent since it is not specified.

**DISCUSSION**

Recent research has challenged the common practice within the dental community of hiding the needle. In many dental schools and texts, the idea of directly describing the dental injection is considered to be taboo and shunned. Ironically, our study demonstrated most caregivers did not perceive deliberate description of the needle as a problem. Only 10 caregivers specifically mentioned the dental injection in their comments, but half of this feedback was positive. The other 40 subjects never mentioned the needle, implying that the blanket practice of hiding the needle is misconstrued. Thus, the tradition of hiding the needle can be challenged just as previously common behavior techniques such as hand-over-mouth and having parents wait outside the operatory were challenged. These old behavior techniques are becoming less acceptable today.

Video modelling that directly addresses the dental injection and restorative procedure can significantly reduce anxiety in children with high dental anxiety before undergoing an invasive dental procedure [19]. Our study supports video modelling as an alternative behavior guidance tool to pharmacological approaches and is an important reminder that multiple solutions exist to overcome dental anxiety. The caregivers in our study demonstrated a significant decrease in anxiety levels before and after viewing the intervention ($p$=.02), and their fears corresponded with their reported children's fears ($p$=.03).

We originally hypothesized that parents with low anxiety levels would report no changes and parents with high anxiety levels would report decreased anxiety levels after the intervention. Yet, when we analyzed the data to categorize anxiety scores we found only a few participants (N = 4) that were deemed highly anxious. Therefore, we analyzed the anxiety scores as continuous data instead. Overall, caregivers' anxiety levels (MDAS) decreased significantly after the intervention ($p$=0.02). Specifically, caregiver anxiety levels decreased significantly for questions regarding scaling ($p$=0.01) and seeing the dentist tomorrow ($p$=0.001). This may indicate that the video would be helpful as a preparatory aid before a dental appointment based on the other findings. However, caregiver anxiety levels did not significantly decrease for the question regarding injections. No change was shown in MDAS anxiety levels regarding injections perhaps due to small sample size and to a skewed distribution of low to moderately anxious caregivers at baseline. Self-selection bias may be a reason for low to moderate MDAS baseline scores. Fearful caregivers may be more likely to decline participation in our study during the screening process.

Unfortunately, there was no significance found between perceptions of video helpfulness with anxiety levels and demographic variables. A larger sample size may have demonstrated more variability in data collection and may have presented different results under data analysis. A small sample size was partially due to a limited supply of expensive equipment for viewing the intervention at the location of the study. Exclusively viewing the video within the clinic in a controlled environment was preferable to viewing the video at home prior to the appointment such that was done in Al-Namankany's study [19].

Another limitation in our study was that caregivers may not have been the best reporters for their child's fears. Although our study did not assess child's dental fears directly and did not show the intervention to the child participants like Al-Namankany's study, the parameters established by caregivers remain valuable. Caregivers prefer to be informed about their children's dental procedures and are more likely to comply with dental appointments when informed with illustrative aids as opposed to verbal information [14]. Unlike similar studies, our study gathered qualitative data that was important in understanding caregiver perspective to assess the value of the video as an intervention. Indeed, 84% of caregivers thought the video would be helpful for their child before a dental appointment. Although we did not ask caregivers to rank preferences of behavior guidance methods, previous studies have determined that parents prefer, and are more likely to comprehend and accept information in video form when given a choice over general anesthesia and conscious sedation [19] [18]. Al-Namankany's and our study both demonstrated that parents accept non-pharmacological approaches to behavior management. Our study has demonstrated that caregivers indicated that a cartoon intervention about dental injections would have benefitted their children as a preparatory aid before a dental procedure. Further research may be able to assess the value of this aid when directly shown to children, and in determining which situations and populations this aid may be most appropriate for.

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## APPENDIX

Figure 1: Study Flow Chart

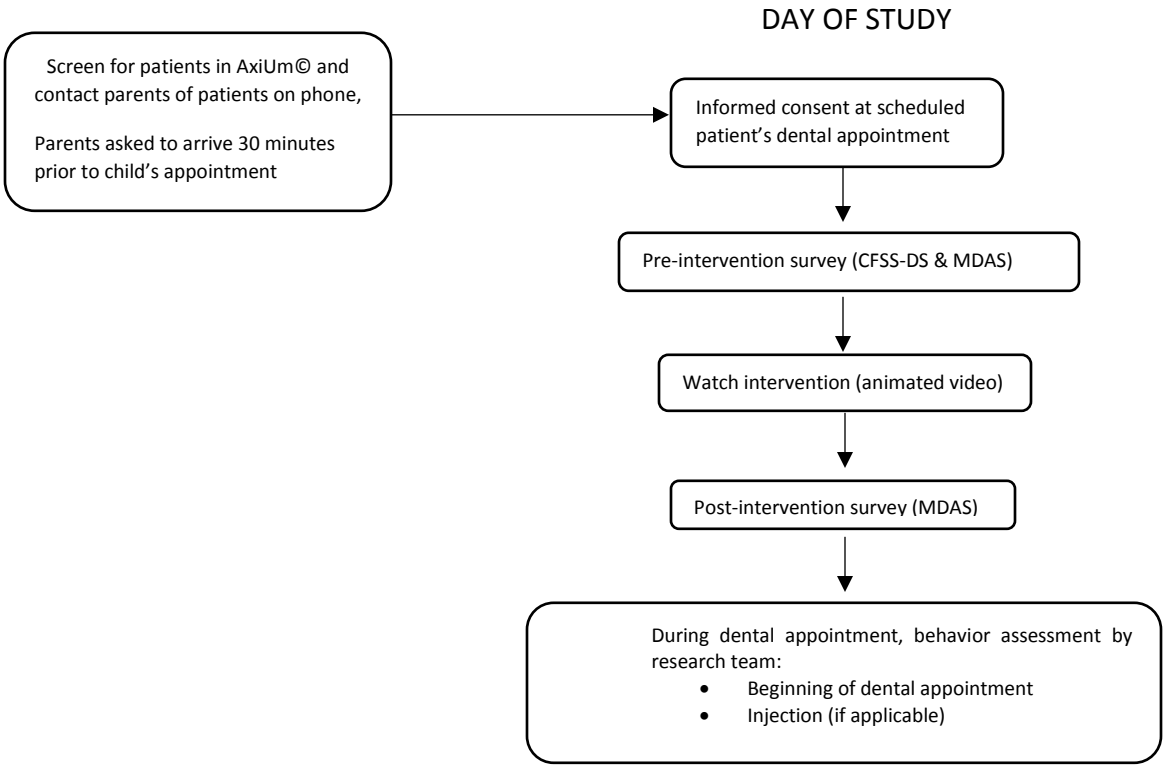

Table 1: Caregiver Demographic Characteristics

| | N = 50 |
|---|---|
| **Caregiver's Age (mean (SD*))** | 39.7 (9.4) |
| **Caregiver's gender** | |
| **Male** | 10 (20.0%) |
| **Female** | 40 (80.0%) |
| **Caregiver's relationship to child** | |
| **Mother** | 37 (74.0%) |
| **Father** | 9 (18.0%) |
| **Other** | 4 (8.0%) |
| **Caregiver's ethnicity** | |
| **Hispanic/Latino** | 10 (20.0%) |
| **Not Hispanic/Latino** | 40 (80.0%) |
| **Caregiver's race** | |
| **White** | 27 (54.0%) |
| **Black/African American** | 3 (6.0%) |
| **Asian** | 6 (12.0%) |
| **Other/Multiple** | 9 (18.0%) |
| **Unreported** | 5 (10.0%) |
| **Caregiver's education** | |
| **Did not finish high school** | 3 (6.0%) |
| **Graduated from high school or completed GED** | 6 (12.0%) |
| **Some college or vocational training** | 15 (30.0%) |
| **2 year college degree** | 7 (14.0%) |
| **4 year college degree** | 11 (22.0%) |
| **Masters or Doctoral degree** | 8 (16.0%) |

*SD = standard deviation

Table 2: Child Demographic Characteristics

| | N =50 |
|---|---|
| **Child's Age (mean (SD*))** | Mean=7.5 (SD=2.2) |
| **Child's gender** | |
| **Male** | 17 (34.0%) |
| **Female** | 32 (64.0%) |
| **missing** | 1 (0.02%) |
| **Child's dental insurance** | |
| **Public/Medicaid** | 40 (80.0%) |
| **Government/Military** | 2 (4.0%) |
| **Private** | 7 (14.0%) |
| **None** | 1 (2.0%) |
| **Child's ethnicity** | |
| **Hispanic/Latino** | 12 (24.0%) |
| **Not Hispanic/Latino** | 38 (76.0%) |
| **Child's race** | |
| **White** | 21 (42.0%) |
| **Black/African American** | 4 (8.0%) |
| **Asian** | 4 (8.0%) |
| **Other/Multiple** | 17 (34.0%) |
| **Unreported** | 4 (8.0%) |

*SD=standard deviation

Table 3: Caregiver's Medical and Dental Experience

| | N=50 |
|---|---|
| **History of caregiver's last dental visit** | |
| **Within four years** | 6 (12.0%) |
| **Within three years** | 1 (2.0%) |
| **Within two years** | 11 (22.0%) |
| **Within the past year** | 30 (60.0%) |
| **Never** | 0 (0.0%) |
| **Cannot remember** | 2 (4.0%) |
| **Reason for caregiver's last dental visit** | |
| **Exam** | 26 (52.0%) |
| **Cleaning** | 36 (72.0%) |
| **Treatment (such as fillings)** | 23 (46.0%) |
| **Infection or toothache** | 9 (18.0%) |
| **Trauma** | 1 (2.0%) |
| **Never been to dentist** | 0 (0.0%) |
| **Cannot remember** | 1 (2.0%) |

Table 4: Child's Medical and Dental Experience

| | | N=50 |
|---|---|---|
| **History of child's last dental visit** | | |
| **Within four years** | | 0 (0.0%) |
| **Within three years** | | 0 (0.0%) |
| **Within two years** | | 3 (0.0%) |
| **Within the past year** | | 46 (92.0%) |
| **Never** | | 0 (0.0%) |
| **Cannot remember** | | 0 (0.0%) |
| **No response** | | 1 (2.0%) |
| **Reason for child's last dental visit** | | |
| **Exam** | | 43 (86.0%) |
| **Cleaning** | | 41 (82.0%) |
| **Treatment (such as fillings)** | | 34 (68.0%) |
| **Infection or toothache** | | 9 (18.0%) |
| **Trauma** | | 4 (8.0%) |
| **Never been to dentist** | | 0 (0.0%) |
| **Cannot remember** | | 1 (2.0%) |
| **Child Behavior At Start of Appointment** | N=50 | |
| **Definitely Negative (-/-)** | | 1 (2.0%) |
| **Negative (-)** | | 2 (4.0%) |
| **Positive (+)** | | 22 (44.0%) |
| **Definitely Positive (+/+)** | | 25 (50.0%) |
| **Child Behavior During Dental Injection** | N=22 | |
| **Definitely Negative (-/-)** | | 1 (4.1%) |
| **Negative (-)** | | 3 (16.7%) |
| **Positive (+)** | | 9 (40.1%) |
| **Definitely Positive (+/+)** | | 9 (40.1%) |

Figure 2: Child Dental Fears from CFSS-DS.

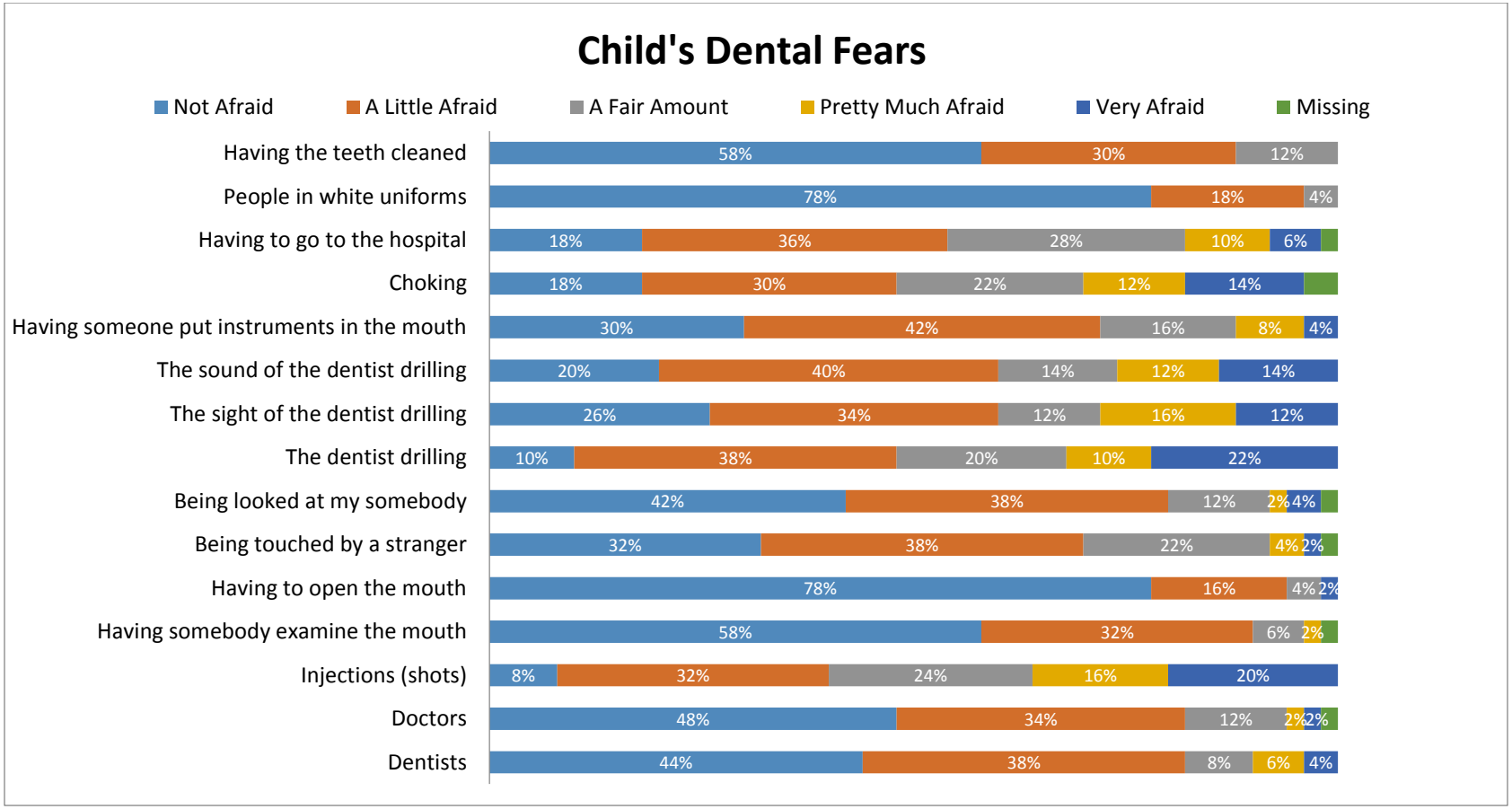

Table 5: Association between Pre-Intervention Caregiver Anxiety with Child's Anxiety using Simple Linear Regression

| | N=50 | | |
|---|---|---|---|
| | slope | Mean (SD*) | p-value |
| **Child Anxiety Levels** | 0.85 | 31.4 (9.8) | **0.03 |

*SD=standard deviation **$p$-value<0.05

Table 6: Association between Pre- and Post-Intervention Caregiver Anxiety Levels using Paired t-test

| | N=50 | | |
|---|---|---|---|
| **Caregiver Anxiety Levels (MDAS)** | Pre-Intervention Mean (SD*) | Post-Intervention Mean (SD*) | p-value |
| **Total MDAS** | 10.0 (4.2) | 8.9 (3.5) | 0.02 |
| **Injection** | 1.9 (1.0) | 1.9 (1.0) | 0.70 |
| **Drilling** | 2.5 (1.2) | 2.3 (1.0) | 0.08 |
| **Seeing dentist tomorrow** | 2.4 (1.3) | 1.7 (0.8) | 0.001 |
| **Scaling** | 1.7 (0.9) | 1.4 (0.6) | 0.01 |
| **Sitting in the waiting room** | 1.5 (0.6) | 1.6 (0.7) | 0.22 |

*SD=standard deviation

Table 7: Associations between finding the video helpful and caregiver demographics

| | Video helpful for child | | |
|---|---|---|---|
| | **No** | **Yes** | **p-value** |
| | N (%) | N (%) | |
| **Caregiver Gender** | | | 0.63* |
| Male | 2 (22.2%) | 7 (77.8%) | |
| Female | 6 (15.0%) | 34 (85.0%) | |
| **Caregiver Relationship** | | | 0.06* |
| Mother | 4 (10.8%) | 33 (89.2%) | |
| Father | 2 (25.0%) | 6 (75%) | |
| Other | 2 (50.0%) | 2 (50.0%) | |
| **Caregiver Ethnicity** | | | 0.18* |
| **Hispanic/Latino** | 0 (0.0%) | 10 (100.0%) | |
| **Not Hispanic/Latino** | xx | xx | |
| **Caregiver Race** | | | 0.51* |
| White | 6 (23.1%) | 20 (76.9%) | |
| Asian | 0 (0.0%) | 6 (100.0%) | |
| Black | 1 (33.3%) | 2 (66.7%) | |
| Other/Multiple | 1 (11.1%) | 8 (88.9%) | |
| **Caregiver Education** | | | 0.89* |
| Did not finish high school | 0(0.0%) | 3 (100.0%) | |
| Graduated from high school or completed GED | 0 (0.0%) | 6 (100.0%) | |
| Some college or vocational training | 4 (26.7%) | 11 (7.3.3%) | |
| 2 year college degree | 1 (14.3%) | 6 (85.7%) | |
| 4 year college degree | 2 (16.2%) | 9 (81.8%) | |
| Masters or Doctoral degree | 1 (14.3%) | 6 (85.7%) | |
| **History of caregiver's last dental visit** | | | 0.32* |
| Within four years | 1 (16.7%) | 5 (83.3%) | |
| Within three years | 0 (0.0%) | 1 (100.0%) | |
| Within two years | 4 (36.4%) | 7 (63.6%) | |
| Within the past year | 3 (10.3%) | 26 (89.7%) | |
| Never | xx | xx | |
| Cannot remember | 0 (0.0%) | 2 (100.0%) | |
| **Reason for caregiver's last dental visit** | | | |
| Exam | 4 (15.3%) | 22 (84.6%) | 1.00* |
| Cleaning | 4 (11.4%) | 31 (88.6%) | 0.20* |
| Treatment (such as fillings) | 3 (13.0%) | 20 (87.0%) | 0.71* |
| Infection or toothache | 3 (33.3%) | 6 (66.7%) | 0.15* |
| Trauma | 0 (0.0%) | 1 (100.0%) | 1.00* |
| Never been to dentist | xx | xx | |
| Cannot remember | 0 (0.0%) | 1 (100.0%) | 1.00* |
| | Mean (SD) | Mean (SD) | |
| **Caregiver Age** | 42.5 (11.7) | 39.2 (9.1) | 0.47** |

*Fisher's Exact Test **2 sample t-test

Table 8: Associations between finding the video helpful and child demographics

| | Video helpful for child | | |
|---|---|---|---|
| | **No** | **Yes** | **p-value** |
| | N (%) | N(%) | |
| **Gender** | | | 0.41* |
| Male | 4 (25.0%) | 12 (75.0%) | |
| Female | 4 (12.5%) | 28 (87.5%) | |
| **Hispanic/Latino** | 1 (8.3%) | 11 (91.7%) | 0.66* |
| **Race** | | | 0.67* |
| White | 5 (25.0%) | 15 (75.0%) | |
| Asian | 0 (0.0%) | 4 (100.0%) | |
| Black | 0 (0.0%) | 4 (100.0%) | |
| Other/Multiple | 3 (17.7%) | 14 (82.4%) | |
| **Insurance** | | | 1.00* |
| Public/Medicaid | 7 (17.9%) | 32 (82.1%) | |
| Government/Military | 0 (0.0%) | 2 (100.0%) | |
| Private | 1 (13.3%) | 6 (85.7%) | |
| None | 0 (0.0%) | 1 (100.0%) | |
| **History of child's last dental visit** | | | 0.43* |
| Within four years | xx | xx | |
| Within three years | xx | xx | |
| Within two years | 1 (33.3%) | 2 (66.7%) | |
| Within the past year | 7 (15.6%) | 38 (84.4%) | |
| Never | xx | xx | |
| Cannot remember | xx | xx | |
| **Reason for child's last dental visit** | | | |
| Exam | 6 (14.3%) | 36 (85.7%) | 0.32* |
| Cleaning | 6 (15.0%) | 34 (85.0%) | 0.63* |
| Treatment (such as fillings) | 5 (15.2%) | 28 (84.9%) | 1.00* |
| Infection or toothache | 2 (22.2%) | 7 (77.8%) | 0.63* |
| Trauma | 1 (25.0%) | 3 (75.0%) | 0.52* |
| Never been to dentist | xx | xx | |
| Cannot remember | 0 (0.0%) | 1 (100.0%) | 1.00* |
| | Mean (SD) | Mean (SD) | |
| **Age** | 6.5 (1.9) | 7.7 (2.2) | 0.13** |

*Fisher's Exact Test **2 Sample t-test

Table 9: Association between Anxiety Levels and Video Helpfulness using Wilcoxon rank-sum test

| | Video Helpful for Child | | | | p-value |
|---|---|---|---|---|---|
| | No (N =8 ) | | Yes (N =42 ) | | |
| | Median (SD*) | IQR** | Median (SD*) | IQR** | |
| **Caregiver Anxiety Levels before the intervention (pre-MDAS)** | 8 (3.5) | (6.5, 11) | 9 (4.4) | (7, 14) | 0.53 |
| **Caregiver Anxiety Levels after the intervention (post-MDAS)** | 7.5 (3.8) | (5.5, 11.5) | 9 (3.5) | (6, 11) | 0.73 |
| **Child's Anxiety Levels (CFSS-DS)** | 31.5 (10.8) | (22.5, 40.5) | 30 (9.7) | (25, 37) | 0.97 |

*SD=Standard Deviation **IQR=Interquartile Range

Table 10: Common Qualitative Response Themes on the Post-Intervention Surveys

| Positive | Negative |
|---|---|
| Helpful information | Length of video |
| Coping strategies | Not accurate |
| Liked the animation | Not age appropriate |
| Liked the child model | Disliked the animation |
| | Disliked the host |
| | Too much information |