Perception Regarding Pediatric Dentist's Appearance and Factors Influencing the Child's Responses

Camila Silva de Amorim* / Raildo da Silva Coqueiro** / Bruna Silva de Menezes *** / Stefanni Olga Aguiar Sales Lima **** / Lucianne Cople Maia ***** / Matheus Melo Pithon ******

Objective: *To develop, validate, and apply an instrument for assessing the children's perception regarding pediatric dentist's appearance, based upon the influence of age, gender, previous dental experience, and anxiety. S**tudy design:** Images and a nine-item questionnaire were developed. The acceptability, convergent-construct validity, and reliability based on reproducibility and internal consistency were evaluated. The validated instrument was applied in a cross-sectional study, with children (n=120) aged 7–12 years asked to evaluate images of pediatric dentists wearing different dental attire (A:all-white (control); B:printed coat and cap, colorful face mask; C:printed coat, cap and face mask; and D:white coat and cap, printed face mask). Children's age, gender, and previous dental experiences were collected with the guardians. The Children's Fear Survey Schedule–Dental Subscale assessed children's anxiety. Descriptive and inferential statistics were carried out (p<0.05). **Results:** The instrument showed excellent acceptability, construct validity with moderate and strong correlations (>0.40), satisfactory reproducibility (ICC >0.70), and internal consistency (Cronbach's alpha coefficient >0.70). Considering only the attire, the children's perceptions were more positive with the use of attire C and D (p<0.05). Intergroup analysis of all the variables did not identify a statistically significant difference (p>0.05). In the intragroup analysis, compared to attire A: younger children have higher perception scores to attire D; girls, children with previous experience and without anxiety favored attire C and D; and children without previous experience showed no difference in comparison to A but did between B and C (p<0.05). **Conclusion:** The C and D attires promoted a more positive perception of the appearance of a pediatric dentist when compared to A; however, age, gender, previous dental experience, and anxiety did not influence the perception scores.*

Keywords: *Children. Questionnaires. Clothing. Pediatric Dentistry. Dental Anxiety.*

*Camila Silva de Amorim MSc, Pediatric Dentistry. Department of Pediatric Dentistry and Orthodontics, School of Dentistry, Universidade Federal do Rio de Janeiro- UFRJ, Rio de Janeiro- RJ, Brazil.

** Raildo da Silva Coqueiro, PhD, Physiological Sciences. Department of Health I, Southwest Bahia State University-UESB, Jequié-BA, Brazil.

***Bruna Silva de Menezes, BA in Dentistry. Department of Pediatric Dentistry and Orthodontics, School of Dentistry, Universidade Federal do Rio de Janeiro- UFRJ, Rio de Janeiro- RJ, Brazil

****Stefanni Olga Aguiar Sales Lima, BA in Dentistry. Department of Health I, Southwest Bahia State University-UESB, Jequié-BA, Brazil.

*****Lucianne Cople Maia, PhD, Pediatric Dentistry. Department of Pediatric Dentistry and Orthodontics, School of Dentistry, Universidade Federal do Rio de Janeiro- UFRJ, Rio de Janeiro- RJ, Brazil.

****** Matheus Melo Pithon, PhD, Orthodontics. Department of Pediatric Dentistry and Orthodontics, School of Dentistry, Universidade Federal do Rio de Janeiro- UFRJ, Rio de Janeiro- RJ, Brazil and Department of Health I, Southwest Bahia State University-UESB, Jequié-BA, Brazil.

Send all Correspondence to:
Matheus Melo Pithon
Av. Otávio Santos, 395 – Sala 705, Centro Odontomédico Dr. Altamirando da Costa Lima, Recreio, Vitória da Conquista, Bahia- BA, Brasil–45020-750
E-mail: matheuspithon@gmail.com

INTRODUCTION

The emotional and behavioral response to dental treatment is an issue of great relevance in pediatric dentistry.[1] Due to the strong association between dental anxiety and uncooperative behavior in a pediatric dental care environment,[2] it is important that the professional can manage it effectively by understanding the factors that reduce anxiety and improve potentially negative behavior during a dental procedure.[3]

The success of a pediatric dentist is not only dependent on the technical skill but also the positive relationship built between dentist and child.[2] When a child is comfortable with the dentist and the dental environment, it is easier to cope with their behavior and stimuli which produce anxiety, helping in delivering effective treatment.[4]

A child's age, cognitive level, temperament and personality, maternal anxiety, reaction to strangers, general anxiety and previous dental experiences can influence their reaction to the dental care environment.[5] While the factors that influence a child's anxiety can vary greatly, the use of more attractive attire by dentists might

contribute to promoting a connect towards the professional.[6] The strength of the relationship between the professional's appearance and its first impression on a child should be considered, as this can help dental surgeons better shape their practices, and thus meet the preferences and needs of their patients.[7]

It is already known that a patient's perception of a professional is influenced by their appearance, which in turn can also affect the level of anxiety and comfort of a patient receiving treatment.[8] Given this, the use of attractive colors in the dentist's attire has been encouraged as an aid to improving communication and alleviating anxiety in children receiving dental care.[9] For attire to positively affect such patients, however, an understanding of how it may influence their perceptions is necessary.[10]

Previous studies have generally evaluated patient perceptions about attire through surveys and feedback elicited before and after clinical treatment, utilizing instruments such as pictures of male and female models dressed in various attire or written descriptions of such attire.[10] It is known of the importance of the appearance of pediatric dentists to their child patients, and that there are limitations on studies that evaluate their perceptions. Thus, the aim of this study was to develop and validate an instrument for assessing the perception of child patients regarding the appearance of pediatric dentists, and its applying it observing the influence of age, gender, previous dental experience and dental anxiety.

MATERIALS AND METHOD

This cross-sectional study was guided by the checklist from the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE)[11] and was approved by the Research Ethics Committee of the Clementino Fraga Filho Hospital of the Universidade Federal do Rio de Janeiro- UFRJ (3.135.486). After being informed about the research, the children who met the eligibility criteria and their guardians signed assent and informed consent forms.

The data were collected from February to December 2019 in the Pediatric Dentistry Clinic of the Dental School of the UFRJ, Brazil. In all stages of the study, children of both genders, aged 7–12 years, were selected.

This study was conducted in two stages: development and validation of the instrument and instrument application.

Development of the instrument

The development of the instrument is described in Figure 1 was based on the methodology proposed by Magno *et al.*[12], including the following steps: (a) Development of images (Figure 2 A-H); (b) Elaboration of the questionnaire items; (c) Items evaluated by pediatric dentists; (d) Items evaluated by educators; (e) Items evaluated by children.

Modifications were made, taking into account all the evaluations and suggestions. This generated a questionnaire containing nine items, with the respective response options and scores (Figure 2-I). The manipulated images were presented, the nine-item questionnaire was applied to each of these, and three answer options (yes, maybe, no) were given. Each answer option corresponded to a score (3, 2, 1 for items with positive indications and 1, 2, 3 for items with negative indications). The final scores per image varied from nine to 27; the higher the score, the more positive the child's perception of the appearance of the paediatric dentist. The Portuguese version of the nine-item questionnaire can be solicited to the corresponding author..

Validity and reliability of the instrument

The final version of the images and nine-item questionnaire was applied to 30 children, aged 7–12 years, at two different times (test-retest), with an interval of 20 days between the two applications. This group was not included in the final sample and was not exposed to dental intervention in the period between the two evaluations.

Figure 1: Description of the instrument's development steps for assessing the perception of child patients regarding the appearance of pediatric dentists

Development of images	Using a digital camera (Canon® EOS Rebel T6, Tokyo, Japan), female and male volunteers were photographed facing the camera, standing against a white background, each with a standardized facial expression and position, but wearing four different combinations of dental-care attire The photographs were manipulated using software (Adobe® Photoshop® CS3 for Windows, San Jose, CA, USA) that overlaid different prints onto the coats and standardized the images, ensuring that the only difference between the eight images was the altered characteristic of interest.
Elaboration of the questionnaire items	The items initially included in the questionnaire resulted from a consensus between pediatric dentists and qualified psychologists. These questions were deemed capable of capturing the children's perceptions pertaining to the influence of the images presented.
Items evaluated by pediatric dentists	The elaborated items were evaluated by three qualified pediatric dentists who analyzed the technical content, made observations, modifications and suggestions, and submitted potential new questions.
Items evaluated by educators	The elaborated items were evaluated by three qualified educators who considered these in terms of the education area, and adapted the items to take into account the understanding and reality of the age group being studied.
Items evaluated by children	Following the modifications suggested by the professionals, 10 children, aged 7–12 years, attended in the Pediatric Dentistry Clinic of the Dental School of the UFRJ analyzed the content of the items regarding terms and words used, and provided questions about the items or the answer options. These children were not included in the final study sample.

Figure 2: Materials used in the questionnaire application: A: All-white attire image (control); B: Printed coat and cap, colorful face mask; C: Printed coat, cap, and face mask; D: White coat and cap, printed face mask (female professional); E (control): All-white attire; F: Printed coat and cap, colorful face mask; G: Printed coat, cap, and face mask; H: White coat and cap, printed face mask (male professional); I: Nine- item questionnaire used in the presentation of the images; J: Visual Analog Scale (VAS) * Items with a negative indication, where the inversion of the score was made.

I	Items	Answers (Scores)
1)	Would you be happy if this dentist took care of your mouth?	Yes (3) Maybe (2) No (1)
2)	Do you think this dentist could be your friend?	
3)	Do you think this dentist would take good care of your teeth?	
4)	Do you think this dentist is cool?	
5)	Do you like how this dentist is dressed?	
6)	Do you think that he/she likes to be a child's dentist?	
7)	Would you recommend this dentist to take care of a little friend of yours?	
*8)	Would you be afraid of this dentist?	Yes (1) Maybe (2) No (3)
*9)	Do you think this dentist would make you feel pain?	

Visual analog scale analysis

To perform the convergent-construct validity test, the visual analog scale (VAS) was applied during the questionnaire validation stage. The VAS is used for the measurement of intangible quantities, usually by way of a 10-cm-long line, along which the patient places a mark at a level that reflects their perception.[13] In this study, to facilitate the children's understanding, they were instructed to choose a point on the line that represented their perception about the image they were looking at (Figure 2-J).

Sample size calculation

The calculation used to define the sample size for this study was performed in G* Power (Version 3.1.9.2, Germany), based on the results obtained from the validation of the instrument.

Initially, the sample size calculation was performed for repeated-measures analysis of variance, considering the following parameters: $f = 0.25$ (medium-effect size); $\alpha = 0.05$; power = 0.80; number of groups = 2 (dichotomized data); repetitions = 4 (image variability); Pearson's correlation coefficient among repeated measures = -0.08 (lowest value obtained in the questionnaire validation); and non-sphericity correction = 0.34 (based on the number of repetitions).

Thus, a minimum sample size of 104 was estimated. Subsequently, an increase of 15% was made as an adjustment for the use of nonparametric testing.[14] Thus, the estimated minimum sample size for the present study was 120 participants.

Data collection and eligibility criteria

The study was performed prior to dental care, in the pediatric dentistry clinic, in order to measure the real perception at the moment of the dental appointment. All the interviews were performed by a single female interviewer who did not wear dental care attire and did not identify himself as a dentist, so as to avoid the influence of the interviewer in the children's responses. The absence of systemic (to avoid the possibility of a greater exposure of the children to a medical environment and any visual, hearing and/or speech impairment) and/or cognitive (due to a possible difficulty in understanding the dynamic of the questionnaire) conditions, and the presence of a guardian at the appointment (part of the data was obtained from the guardian), were the eligibility criteria for this study.

Sociodemographic data and previous dental experience

The sociodemographic (gender and age) and previous dental experience data (whether there was the previous visit to the dentist) of the children were assessed through guardians interviews.

Evaluation of dental anxiety–Brazilian version of the Children's Fear Survey Schedule–Dental Subscale (B–CFSS–DS)

The CFSS - DS is a scale consisting of 15 items, whose answers are scored on a five - point scale, from one (not afraid) to five (very afraid), where the sum of all response scores generates a range of 15 to 75.[15] It was used the Brazilian version (B – CFSS – DS) presenting results as means and scores, where the cutoff point to define anxiety was ≥ 33.[16]

Instrument application for evaluating the perception of child patients to the appearance of pediatric dentists

To verify the children's preferences regarding pediatric dentist attire, the images were presented together on a notebook (Dell® Inspiron, 15", Eldorado do Sul, RS, Brazil), at a distance of approximately 20 inches from the seated child, for a period of up to 1 minute. The following question was asked: **"Which of these dentists would you choose to take care of your teeth?".**

After the preference assessment, the images were presented again (following the order of Figure 2 A-H), this time one at a time, and the child was not allowed to return to the previous image. The nine-item questionnaire was applied to each of the eight images. As mentioned above, the score for each image ranged from nine to 27 points, and the higher the score, the more positive the child's perception was regarding the appearance of attire of the pediatric dentists in the images.

Statistical analysis

Acceptability was assessed using the proportion of individuals who did not respond to all items. The presence of floor and ceiling effects was investigated by analyzing the frequency of the responses. The floor effect occurs when more than 15% of the responses are concentrated on the minimum value, and the ceiling effect becomes apparent based on the maximum value of the scales.[17]

The convergent-construct validity was verified by the correlation between the measurements of the questionnaire and the VAS of perception of appearance, using Spearman's correlation coefficient. Moderate and strong correlations ($\rho \geq 0.40$) were considered adequate.[18]

The reliability was assessed by measure error, according to the criterion of temporal stability of the measure (reproducibility); that is, the agreement between repeated measures (test-retest) by the intraclass correlation coefficient (ICC), and by the internal consistency (Cronbach's alpha coefficient). A Cronbach's alpha coefficient of > 0.70 was considered to be evidence of internal consistency[17] and temporal stability (ICC > 0.70)[19].

Instrument application

Descriptive statistics procedures were used to express the results as absolute and relative frequencies, means and standard deviations. A descriptive analysis was performed to evaluate the results of the children's preferences for pediatric dentist attire. The median age was used (9 years), dividing the variable into two age groups (7–9 and 10–12 years).

For the inferential analysis, initially, assumptions for the application of parametric statistics were tested, such as normality (Kolmogorov–Smirnov test) and homoscedasticity (Levene test). Following verification of the violation of these assumptions, non-parametric tests were applied.

Intergroup comparisons (age, gender, previous dental experience, dental anxiety) were tested using the Mann–Whitney test. An intragroup analysis to compare the effects of the different attire on perceptions of the appearance of pediatric dentists was performed using the Friedman test. In cases where there was statistical significance, comparisons between pairs were made using the Wilcoxon test.

The level of significance adopted in the study was 5% ($\alpha = 0.05$), and all analyses were performed using IBM SPSS Statistics for Windows (IBM SPSS 21.0, 2012, Armonk, NY).

RESULTS

The instrument was validated using 30 children, aged between 7 and 12 years, with a mean age of 9 ± 1.5 years, with 53.3% (n = 16) being girls and 46.7% (n = 14) boys. These participants were not included in the questionnaire application.

All nine items of the questionnaire had a response rate of 100%, indicating excellent acceptability of the instrument. No floor effect was observed, while the ceiling effect was detected in all images. The convergent-construct validity analysis between the scores of the questionnaire of perception of child patients regarding the appearance of pediatric dentists and the VAS (Spearman's correlation coefficient) showed moderate correlations for images A, B and C, and strong correlations for image D. The reliability measures showed satisfactory degree and agreement rates for the internal consistency and test-retest (reproducibility), regardless of the image evaluated (Table 1).

The study included 120 children, aged between 7 and 12 years (mean of 9 ± 1.5 years), of whom 75 (62.5%) were in the 7-9 year age group, 69 (57.5%) were girls, 105 had previous dental experience and 73 (60.8%) had no dental anxiety.

In a preliminary analysis, it was observed that the professional's gender did not influence the children's perception of the pediatric dentists' appearance (Figure 3). Thus, the means of the scores attributed to the professionals of both genders, for each type of attire, were chosen for subsequent analyses.

The all-white attire on the female professional (A) was the most selected in the general preference and between the study variables (age group, gender, previous dental experience, dental anxiety) (Table 2).

Overall, all the types of dental attire resulted in high scores for perception of appearance, indicating that, in general, the children had a positive perception of professionals, regardless of their attire. Despite this, there was a statistical difference in the score based on type of dental attire, where the attire C and D were scored higher (i.e., were perceived more positively), with no significant difference between them, when compared to attire A (control). The scores for attire B did not differ from those of attire A (control) (Table 3).

Table 1: Analyzes for instrument validation

Image	Floor and ceiling effects		Convergent-construct validity		Reliability (Internal consistency and reproducibility)		
	Floor (%)	Ceiling (%)	ρ -Spearman	p-value	Items	Cronbach's Alpha	ICC (CI 95%)
Attire A	3.3	20.0	0.59	0.001	9	0.92	0.88 (0.76–0.94)
Attire B	0.0	20.0	0.48	0.008		0.74	0.79 (0.61–0.90)
Attire C	3.3	43.3	0.59	0.001		0.94	0.84 (0.69–0.92)
Attire D	3.3	23.3	0.71	< 0.001		0.94	0.80 (0.62–0.90)

A (control): All-white attire; B: Printed coat and cap, colorful face mask; C: Printed coat, cap, and face mask; D: White coat and cap, printed face mask; ICC: Intraclass correlation coefficients; CI 95%: Confidence interval of 95%

Figure 3: Perception regarding the appearance of pediatric dentists, according to the type of dental attire and sex of the professional. The height of the rectangle represents quartiles 1 and 3; the line that cuts the rectangle represents the median; semi-straights connect the quartiles 1 and 3 to the minimum and maximum values.*Mann-Whitney test.

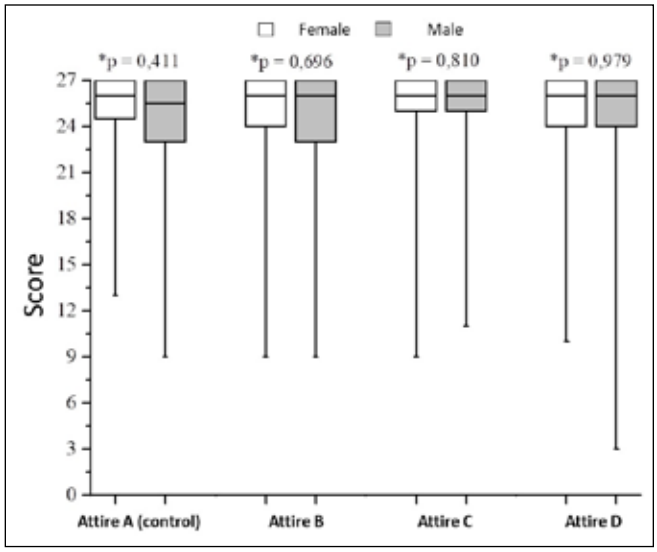

Table 3: Children's perception regarding pediatric dentist's appearance, according to the type of dental attire.

Type of dental attire	Mean	Standard deviation
Attire A (control)	24.35	3.40
Attire B	24.65	2.70
Attire C	25.08†	2.78
Attire D	24.69†	3.16
* p-value	0.002	

A (control): All-white attire; B: Printed coat and cap, colorful face mask; C: Printed coat, cap, and face mask; D: White coat and cap, printed face mask * Friedman test; † indicates a significant difference ($p < 0.05$) concerning Attire A (control).

Table 2: Descriptive analysis expressed in frequency and percentage of the children's preferences regarding pediatric dentists' attire

		Age Group		Sex		Previous dental experience		Dental anxiety	
Image	General preference n (%)	7-9 years n (%)	10-12 years n (%)	Girls n (%)	Boys n (%)	No n (%)	Yes n (%)	No n (%)	Yes n (%)
A	39 (32.5)	19 (25.3)	20 (44.4)	24 (34.8)	15 (29.4)	5 (33.3)	34 (32.4)	26 (35.6)	13 (27.7)
B	22 (18.3)	18 (24.0)	4 (8.9)	18 (26.1)	4 (7.8)	2 (13.3)	20 (19.0)	11 (15.1)	11 (23.4)
C	18 (15.0)	12 (16.0)	6 (13.3)	16 (23.2)	2 (3.9)	2 (13.3)	16 (15.2)	10 (13.7)	8 (17.0)
D	14 (11.7)	5 (6.7)	9 (20.0)	7 (10.1)	7 (13.7)	1 (6.7)	13 (12.4)	8 (11.0)	6 (12.8)
E	11 (9.2)	9 (12.0)	2 (4.4)	1 (1.4)	10 (19.6)	2 (13.3)	9 (8.6)	8 (11.0)	3 (6.4)
F	5 (4.2)	4 (5.3)	1 (2.2)	1 (1.4)	4 (7.8)	2 (13.3)	3 (2.9)	3 (4.1)	2 (4.3)
G	10 (8.3)	7 (9.3)	3 (6.7)	2 (2.9)	8 (15.7)	0 (0.0)	10 (9.5)	6 (8.2)	4 (8.5)
H	1 (0.8)	1 (1.3)	0 (0.0)	0 (0.0)	1 (2.0)	1 (6.7)	0 (0.0)	1 (1.4)	0 (0.0)
Total	120 (100)	75 (100)	45 (100)	69 (100)	51 (100)	15 (100)	105 (100)	73 (100)	47 (100)

A (control): All-white attire; B: Printed coat and cap, colorful face mask; C: Printed coat, cap, and face mask; D: White coat and cap, printed face mask (female professional); E (control): All-white attire; F: Printed coat and cap, colorful face mask; G: Printed coat, cap, and face mask; H: White coat and cap, printed face mask (male professional)

The intergroup analysis showed that there were no significant differences in perception between groups of the study variables (age group, sex, previous dental experience, and dental anxiety) (Table 4). The following results of the intragroup analysis are also shown in Table 4:

- According to age group, there was a statistical difference in the scores for perception of attire only in children aged 7 to 9 years, with the scores of perceptions in younger children being higher for attire D than for attire A (control).
- There was a statistical difference in the perception scores between the types of attire only in girls. The data showed that the perception scores among girls were higher for attire C and D, compared to A (control).
- Among children who had previous dental experience, the perception scores were higher for attire C and D, compared to attire A (control). Among children who had no previous dental experience, none of the attire was perceived as more positive when compared to attire A (control). There was, however, a significant difference between attire B and C.
- There was a statistical difference in the perception scores between the types of attire only in children who did not present dental anxiety. The data showed that the perception scores of children without dental anxiety were higher for attire C and D, compared to attire A (control).

Table 4: Perception regarding pediatric dentist's appearance, according to the type of dental attire and children's age group; sex; previous dental experience and dental anxiety

Image	Age group		*p-value	Sex		*p-value	Previous dental experience		*p-value	Dental anxiety		*p-value
	7-9 years	10-12 years		Girls	Boys		No	Yes		No	Yes	
Attire A	24.07 ± 3.83	24.81 ± 2.50	0.550	24.15 ± 3.76	24.61 ± 2.87	0.714	24.27 ± 3.98	24.36 ± 3.33	0.845	24.50 ± 3.01	24.11 ± 3.96	0.701
Attire B	24.45 ± 2.93	25.00 ± 2.25	0.445	24.87 ± 2.24	24.36 ± 3.22	0.580	25.30 ± 1.49	24.56 ± 2.83	0.552	24.89 ± 2.17	24.29 ± 3.36	0.852
Attire C	24.84 ± 3.01	25.47 ± 2.32	0.250	25.30 ± 2.61‡	24.78 ± 2.99	0.138	25.80 ± 1.61	24.97 ± 2.90‡	0.216	25.35 ± 1.94‡	24.65 ± 3.71	0.816
Attire D	24.42 ± 3.70‡	25.14 ± 1.91	0.956	24.86 ± 3.04‡	24.46 ± 3.33	0.236	25.17 ± 2.27	24.62 ± 3.27‡	0.724	25.07 ± 2.65‡	24.11 ± 3.77	0.581
†p-value	0.030	0.109		0.002	0.380		0.014	0.043		0.003	0.400	

A (control): All-white attire; B: Printed coat and cap, colorful face mask; C: Printed coat, cap, and face mask; D: White coat and cap, printed face mask; *Mann-Whitney test; †Friedman test; ‡indicates a significant difference ($p < 0.05$) concerning Attire A (control) by Wilcoxon test.

DISCUSSION

Positive or negative perceptions contribute to how a child behaves towards a dentist, being the professional's appearance very important in the in non-verbal communication[20] Although several studies have already observed the influence of dental attire in the management of child care, this study was innovative in developing and validating an instrument to assess children's perception of the appearance of pediatric dentists, in order to understand the influence exerted by other factors.

Evaluating the validity is the first step in determining the accuracy of an instrument.[12] The developed instrument was thus examined, the results showing good acceptability, reliability and validity, making it able to be applied to the sample of children, aged between 7 and 12 years. The excellent acceptability, as well as the absence of missing data, can be related to the fact that the questionnaire was applied in the form of an interview, ensuring rigor in the proposed methodology.

In dentistry, there is a high risk of transmission of infection between the dentist and the patient, thus the use of protective equipment, such as gloves, face masks, eyewear and caps is highly recommended.[4] Biosafety must be respected, even when considering making the appearance of the attire more attractive to children. Consequently, the variations in the images used in this study related only to dental attire that would be viable for care, not other alternatives, which differs from other studies, in which options for casual or formal attire were given.[6, 7, 9, 21–23]

Because the focus of this work was on evaluating perception, only an exploratory analysis of the preference results was carried out, in order to offer an overview of these data in the study sample. The greatest preference was for the female professional with all-white attire, and this result is in agreement with the findings of most other studies.[2, 21, 23–25] It can be explained by the use of white attire usually shows confidence and gives the image of a competent and focused professional.[24] It is important to note that children can associate the image of health professionals with the use of white, a fact that can influence the response of children who may not necessarily prefer this attire, but who choose it because they think it would be the best answer.

It is worth mentioning that, although a specific analysis was not made for this evaluation, all the preferred attire choices were worn by female professionals, as has been previously observed.[2] Children tend to prefer dentists of their own gender[7, 26] and there was a slightly higher proportion of girls, so the greater preference for female professionals may be due to this. Further justification could also be attributed to the perception that female dentists are more caring, humane and empathetic, and dedicate more time and attention to their patients.[2, 23]

Because the developed instrument presented images to be evaluated individually, it was decided to record the perception regarding each image, as an indication of the impact of the differences between them and not the perception overall. Even so, the high scores for all images did show a positive perception overall, considering the initial proposal that the higher the score, the more positive the children's perception of the attire.

Significantly higher perception scores were reported for attire C and D, indicating a more positive perception than for attire A. It is already known that the presence of distractors on a dentist's attire can draw a child's gaze.[27] Because both attire C and D had a print on them, in addition to promoting a more positive perception, this could also contribute to a child's distraction during dental care. It is noteworthy that attire A was the most preferred, suggesting that the children's preference was different from their perception.

What is interesting about this divergence is that this preference may be related to a child's tendency to have a preference based on their own or others' experiences, or relating to what they consider most appropriate. On the other hand, perception presents itself as a more sensorial experience, where pre-existing ideas have the opportunity to be deconstructed, allowing the child's actual interpretation to be exposed. As no previous studies were found that have addressed perception analysis, as undertaken in this study, the data is discussed below in terms of the literature, which most often refers to preference.

The children's preference regarding attire type and color are associated with emotions via cognitive experiences; therefore, it is expected that a child's preference will vary with age.[9,28] There was no statistically significant difference in the perception scores between the two age groups; however, the younger age group showed a more positive perception towards pediatric dentists dressed in attire D than attire A. Attire D, although being all white, had a print on the face mask that may have attracted the attention of the younger children, combining the color considered ideal for dental care with a playful component. This result agrees with the findings of Panda *et al.*,[4] who observed that younger age groups were more amenable to the idea of pediatric dentists wearing masks with cartoons painted on them, compared to older age groups.

Alsarheed [24] observed that children's perceptions of their dentist depended on their gender, with girls liking their visit to the dentist more than boys. In this study, the gender of the children did not influence their perception of the pediatric dentists, as also reported by Ram *et al.*[22] Among the girls, however, a more positive perception was related to attire C and D than to A. There were no differences in the perception scores regarding the attire among the boys; however, Ravikumar *et al.*[26] found that boys showed a greater preference for white attire, while girls preferred surgical scrubs.

A child's perception of dental care is shaped by their early experiences.[20] A statistical difference was observed in the perception scores between the types of attire in relation to children with and without previous dental experience. Children with previous experience had a more positive perception towards attire C and D, compared to A. It is already known that children may favor white due to their expectations based on previous experiences.[4] Although having previous dental experience, the perception about all-white attire was no more positive, indicating a difference between preference and perception. This result may also have been influenced by the attire of the professionals who have attended these children previously.

The group without previous experience did not present differences in the perception scores between the different attire when compared to attire A, however, thus minimizing the influence of the all-white attire. In this children higher perception scores were reported for attire C, which had the printed face mask, when compared to B, which had a colorful face mask, but without a print. This differs from the findings of Panda *et al.*[4], who reported that most of the children preferred their dentists to wear plain masks, as opposed to masks with cartoons printed on them.

Small changes in the appearance of pediatric dentists may help children feel more comfortable and reduce their level of anxiety, thereby increasing their probability of seeking dental treatment.[20] When assessing the influence of anxiety on children's perception, there was no difference in the scores between children with and without anxiety. Tong *et al.*[7] also found no influence on children's anxiety scores in their preference for dentist attire. Among children without dental anxiety, however, a more positive perception was observed towards attire C and D, and among girls. What distinguished these types of attire from the others was the feature of a printed mask. This feature may have contributed more to the more positive perception than the color of the coat because one was printed and the other was white.

Having analyzed the results, the discussion about perception and preference returns. As no more positive perceptions were reported from wearing the all-white attire, it was observed that the concept of perception favors an openness to the new, while preference can meet resistance to leaving the comfort of the known over the years, in relation to the appearance of health professionals. Although the popular view that children are afraid of white-attired professionals could not be supported, the concept of 'child-friendly' attire might present an alternative to help facilitate the first appointment with a child.[6]

The most significant part of this study was the innovation of developing, validating and applying an instrument that brought together images and a questionnaire to allow the assessment of the perception of child patients of the appearance of pediatric dentists. The difficulty of finding studies in the literature that could enrich the discussion about perception was identified, leading to a realization of the limited use of data related to preference. This should encourage further studies to assess children's perceptions regarding the appearance of pediatric dentists.

CONCLUSIONS

The developed instrument presented good acceptability, reliability and validity, being applied effectively in the study. A general preference for a female dentist with all-white attire was reported. Also, a positive perception of pediatric dentists regardless of the attire worn. The wearing of C and D attires contributed to more positive perceptions; however, age, gender, previous dental experiences, and dental anxiety did not influence the perception scores. Furthermore, none of the analyses showed more positive perceptions to the appearance of the pediatric dentist wearing all-white attire.

Acknowledgments

To Janaina Nascimento Teixeira Chaves and Edson Paiva Pereira Júnior for the study's images. This study was conducted during the masters' stage of Camila Silva de Amorim under the supervision of the Prof Matheus Melo Pithon. This study was financed in part by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brasil (CAPES) – Finance Code 001.

REFERENCES

1. Khandelwal M, Shetty RM, Rath S. Effectiveness of Distraction Techniques in Managing Pediatric Dental Patients. Int J Clin Pediatr Dent;12(1):18-24. 2019.
2. Nirmala S, Veluru S, Nuvvula S, Chilamakuri S. Preferences of dentist's attire by anxious and nonanxious Indian children. J Dent Child;82(2):97-101. 2015.
3. Sharma A, Kumar D, Anand A, Mittal V, Singh A, Aggarwal N. Factors predicting Behavior Management Problems during Initial Dental Examination in Children Aged 2 to 8 Years. Int. J Clin Pediatr Dent;10(1):5-9. 2017.
4. Panda A, Garg I, Bhobe AP. Children's perspective on the dentist's attire. Int J Paediatr Dent;24(2):98-103. 2014.
5. AAPD. Guideline on Behavior Guidance for the Pediatric Dental Patient. Pediatr Den.;38(6):185-98. 2016.
6. Kuscu OO, Caglar E, Kayabasoglu N, Sandalli N. Short communication: preferences of dentist's attire in a group of Istanbul school children related with dental anxiety. Eur Arch Paediatr Dent;10(1):38-41. 2009.
7. Tong HJ, Khong J, Ong C, Ng A, Lin Y, Ng JJ, et al. Children's and parents' attitudes towards dentists' appearance, child dental experience and their relationship with dental anxiety. Eur Arch Paediatr Dent;15(6):377-84. 2014.
8. Brosky ME, Keefer OA, Hodges JS, Pesun IJ, Cook G. Patient perceptions of professionalism in dentistry. J Dent Educ;67(8):909-15. . 2003.
9. Asokan A, Kambalimath HV, Patil RU, Maran S, Bharath K. A survey of the dentist attire and gender preferences in dentally anxious children. J Indian Soc Pedod Prev Dent;34(1):30. 2016.
10. Petrilli CM, Mack M, Petrilli JJ, Hickner A, Saint S, Chopra V. Understanding the role of physician attire on patient perceptions: a systematic review of the literature—targeting attire to improve likelihood of rapport (TAILOR) investigators. BMJ open;5(1):e006578. 2015.
11. Von Elm E, Altman D, Egger M, Pocock S, Gøtzsche P, Vandenbroucke J. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies [published correction appears in Ann Intern Med; 148: 168]. Ann Intern Med. 2007;147(8):573-7. . 2008.
12. Magno MB, de Paiva Cabral Tristao SK, Jural LA, Aguiar Sales Lima SO, Coqueiro RDS, Maia LC. Does dental trauma influence the social judgment and motivation to seek dental treatment by children and adolescents? Development, validation, and application of an instrument for the evaluation of traumatic dental injuries and their consequences. Int J Paediatr Dent;29(4):474-88. 2019.
13. Heller GZ, Manuguerra M, Chow R. How to analyze the Visual Analogue Scale: Myths, truths and clinical relevance. Scand J Pain;13:67-75. 2016.
14. Lehmann EL. Nonparametrics: Statistical methods based on ranks. New York: Springer; 2006.
15. Cuthbert MI, Melamed BG. A screening device: children at risk for dental fears and management problems. ASDC J. Dent. Child;49(6):432-6.1982.
16. Cademartori MG, Cara G, Pinto GDS. Validity of the Brazilian version of the Dental Subscale of Children's Fear Survey Schedule. Int J Paediatr Dent;29(6):736-47. 2019.
17. Coluci MZO, Alexandre NMC, Milani D. Construção de instrumentos de medida na área da saúde. Ciênc. Saúde Colet;20:925-36. 2015.
18. Eduardo AHA, dos Santos CB, Carvalho AMP, de Carvalho EC. Validation of the Brazilian version of the Quality of Recovery-40 Item questionnaire. Acta Paul. Enferm.;29(3):253-9. 2016.
19. Streiner DL, Norman GR, Cairney J. Health measurement scales: a practical guide to their development and use: Oxford University Press, USA; 2015.
20. Yahyaoglu O, Baygin O, Yahyaoglu G, Tuzuner T. Effect of Dentists' Appearance Related with Dental Fear and Caries aStatus in 6-12 Years Old Children. J Clin Pediatr Dent;42(4):262-8. 2018.
21. Mistry D, Tahmassebi J. Children's and parents' attitudes towards dentists' attire. Eur Arch Paediatr Dent;10(4):237-40. 2009.
22. Ram D, Hermida ML, Jerozolimsky AB, Slav O-Y, Wang H-Y, Abbate FP, et al. Children's Preferences for Pediatric Dentist Attire: A Multicenter Study. J Clin Pediatr Dent; 42(3):195-202. 2018.
23. Souza-Constantino AM, Claudia de Castro Ferreira Conti A, Capelloza Filho L, Marta SN, Rodrigues de Almeida-Pedrin R. Patients' preferences regarding age, sex, and attire of orthodontists. J Orthod Dentofacial Orthop;154(6):829-34.e.12018.
24. Alsarheed M. Children's Perception of Their Dentists. Eur J Dent. 2011;5(2):186-90.
25. Ellore VPK, Mohammed M, Taranath M, Ramagoni NK, Kumar V, Gunjalli G. Children and parent's attitude and preferences of dentist's attire in pediatric dental practice. Int J Clin Pediatr Dent;8(2):102. 2015.
26. Ravikumar D, Gurunathan D, Karthikeyan S, Subbramanian E, Samuel VA. Age and environment determined children's preference towards dentist attire-A cross-sectional study. J Clin Diagn Res;10(10):ZC16. 2016.
27. Celine G, Cho V, Kogan A, Anthonappa R, King N. Eye-tracking in dentistry: What do children notice in the dentist? J Dent;78:72-5. . 2018.
28. Babaji P, Chauhan P, Churasia VR, Kaur T, Singh S, Augustine M. A cross-sectional evaluation of children preference for dentist attire and syringe type in reduction of dental anxiety. Dent Res J (Isfahan);15(6):391-6. 2018.