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Original Article

Student's Perceptions about Pediatric Dental Behavior Guidance Techniques throughout a five-year Dental Curriculum

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Abstract

Objective: To compare students' views about behavior management techniques (BMT) in pediatric dentistry, besides to identify whether educational components of dental curriculum may influence their perceptions. **Material and Methods:** Questionnaires with 18 statements, describing the techniques and clinical situations were distributed to students (n=83) from first- (P1), third- (P2) and eighth- (P3) semesters. Student's acceptability scores were measured with a Likert scale from 0 (total disagreement) to 10 (total agreement). Statistical analysis was performed using Mann Whitney U test. **Results:** P3 students agreed with most of BMTs. Pair comparisons between P1-P2 showed significant increase of means for Told treatment may involve pain and Sedative, besides significant decrease for Use of euphemisms. Comparisons between P2-P3 and P1-P3 indicated significant increase in the acceptability for: Voice control, Told not to be coward, Modeling, Blunting, Use of euphemisms, Parent not present, HOME, Active and Passive Immobilization and pharmacologic techniques. In all semesters, Verbal positive reinforcement, Distraction and Tell-show-do were the most accepted techniques, however, there was no consensus regarding to the least accepted one. Promising a toy became less acceptable throughout the semesters and Parent not present became more acceptable. **Conclusion:** These findings indicate that educational process may influence on the students' perceptions about BMTs.

Keywords: Dental Education; Pediatric Dentistry; Child Behavior.

Introduction

One of the most challenging problems faced by dental practitioners and dental students is behavior management. Psychological variables (anxiety and/or stress), socio-cultural (individual characteristics, children's maturity, previous dental experience) and legal requirements (parent's consent) are involved in dental treatment, interfering with professional performance [1,2].

To be successful in pediatric dental treatment, it is necessary to choose adequate strategies, based on procedures that stimulate children's cooperative behavior, knowledge which should have been acquired during formal dentistry training [3].

A wide range of procedures has been used to manage children's behavior. Tell-show-do (TSD) was introduced in 1959 and it is one of the most frequently used techniques [4]. It involves the explanation of what is going to happen, in appropriate way to child's comprehension, then the demonstration and finally, the procedure is performed [2]. In the Voice control, volume and tone of voice are changed to achieve the child's attention during a disruptive behavior [5]. Eufemisms are also widely used and consists in metaphors and comparisons to facilitate child's understanding (i.e. 'your teeth are going to sleep') [3]. Distraction is another well-established strategy in pediatric dentistry, which includes the presentation of cartoons, videos, music, stories or even talks to the patients to deflect their attention away during the treatment [5]. When is used to keep instruments potentially harmful out of the patient's view, for example, during the local anesthetic injection, it is defined as Blunting [6]. In the Positive Verbal Reinforcement, children are praised when show acts of cooperation. When they receive something of value, like toys or sticker-badges as a reward for being cooperative; it is named Promising a toy [2]. Modelling was described as the process of acquiring behavior through observation of a model, who may be parents, teachers, siblings or any other child, since she/he has good behavior during the treatment [7]. Some restrictive methods are also used, like Active Immobilization by dentist and/or dental assistants [8]; Passive Immobilization, when mechanical device or equipment are used to restricts child's movement [9] and Hand-over-mouth exercise (HOME), that consists in placing the hand gently over the child's mouth, in cases of hysterical behavior, and explains calmly what the behavioral expectations [10]. In May, 2006, the American Academy of Pediatric Dentistry (AAPD) eliminated HOME from clinical guidelines on behavior management, but some pediatric dentists still believe that it is an acceptable management technique [11]. Pharmacologic techniques involve sedation, use of nitrous oxide and general anesthesia. Sedation consists of administering anxiolytics aiming to reduce child's anxiety during the treatment and it is the second most frequently used pharmacologic technique used [12]. The Nitrous Oxide is administered to the patient, who remains awake but calm and able to follow verbal instructions [13]. General anesthesia is indicated for patients, who have psychological or emotional immaturity; for whom local anesthesia is ineffective due to acute infection, in cases of anatomic variations or allergy; who are extremely uncooperative and children or adolescents who require significant surgical procedures [14].

There are some studies evaluating the acceptability of these behavior management techniques (BMT) during dental treatment. Some of them examined parent's views and attitudes [15-17] and others compared how children felt faced these strategies [7,8]. In general, children used to judge a behavior management technique according to the way it looked, so HOME (hand over mouth exercise) was the least acceptable BMT, whereas the most acceptable was TSD (tell-show-do) [8]. Interestingly, it was observed the same reaction by parents, which considered HOME an aggressive technique [15,16] and TSD, the safest of all [17].

On the other hand, professionals and student's views appears to vary according to not only personal experience, but also used to be influenced by educational process [18]. The majority of dental schools used to spend fewer than 5 hours of classroom time to teach BMT [19]. At the same time, it is known that are the universities which provide opportunities to build clinical and behavioral management skills, besides to shape students' attitudes towards those skills, so that to a large extent, a dentist's perceptions about pediatric dental behavior management techniques are based on the information obtained during their dental education and on the experiences derived from the contact with patients.

Dental students in the beginning of the course used to have none to limited prior exposure to behavior guidance techniques, thus their view could be compared, to a certain extent, to parents' and children' perception [20]. Nevertheless, as they receive didactics classes about BMT and start to provide treatment for children, their view may be changed by influence of educational process [21].

Thereby, the purpose of this study was to compare first-, third- and eighth-semester students' views about behavior management techniques in pediatric dentistry, besides to identify whether educational components of dental curriculum may influence students' perceptions regarding to this issue. The null hypothesis is that the educational process do not influence on students' perception.

Material and Methods

This study was approved by the Ethical Committee (225/11) at the Federal University of Paraíba (UFPB) in accordance with the ethical guidelines in research with human beings.

For the purpose of the study, were considered suitable students from first-semester (P1), since they were relatively uninformed about behavior management techniques; third-semester (P2), who had already received some information about BMT and eighth-semester students (P3), who had didactics classes about BMT as well as clinical experience.

A questionnaire used in a previous study [20] was adapted. It consisted of 18 statements, describing pediatric dental behavior management techniques and clinical situations. To obtain students' acceptability scores, they had to mark on a Likert scale from 0 (strong /total disagreement) to 10 (strong/total agreement). A pilot study was performed with five students of each semester to check the comprehension of questions and the requirement to do adjustments in the questionnaire. The questionnaire was considered suitable for the purpose of the study, since the students

understood the statements and no adjustment was necessary. Questionnaires were administered in masse to first-(P1), third-(P2), and eighth-semester students (P3). From a total of 110 students: 38 on the first semester (P1), 35 on the third (P2) and 37 on the eighth (P3), 83 students returned completed questionnaires. Twelve students declined participation: 3 from the first-semester (P1), 5 from the third-semester (P2) and 4 from the eighth-semester (P3). Participation was voluntary and the responses were anonymous.

Quantitative results were categorized into qualitative groups, according to means, estimating BMT's acceptability by students (Figure 1): total disagreement (0 – 1.9); disagreement (2.0 – 3.9); neutral (4.0 – 5.9); agreement (6.0 – 7.9) and total agreement (8.0 – 10.0). Thus, it was possible to analyze if the educational components of dental curriculum may influence the students' perceptions regarding to pediatric dental behavior management techniques.

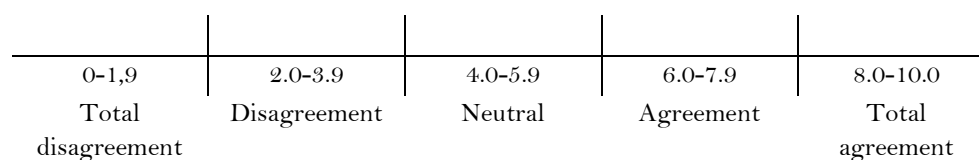


Figure 1. Rating of acceptability used to determine qualitative importance of shifts in student's perception of Federal University of Paraíba.

The data were submitted to Shapiro-wilk test to check the normality and after the Mann–Whitney U test were used to evaluate differences statistically significant between the eighth-semester (P3) means and those obtained at the first-(P1) and third-(P2) semesters, as well as between P1 and P2. All statistical analyses were performed with a statistical software program, considering $p \leq 0.05$.

Results

There were a total of one hundred and ten students in these three semesters. From the total, 83 students returned completed questionnaires: 30 from the first-semester (P1), 25 from the third-semester (P2) and 28 from the eighth-semester (P3).

Means that students from first-(P1), third-(P2) and eighth-(P3) semesters attributed to different behavior management techniques or clinical situations and statistically significant changes between them are shown in Table 1. First-semester students' means (P1) were >6.0 , showing agreement with Verbal positive reinforcement, Use of euphemisms, Tell-show-do, Distraction, Voice control, Promised a toy and Modeling. Nonetheless, Not permitting child talk, Parent not present, HOME, Active and Passive Immobilization, as well as all of pharmacological techniques had means <4.0 , what revealed that they disagreed with these techniques. In general, third-semester students' means (P2) were similar to P1, whereas eighth-semester students' means (P3) indicated agreement

with most of the techniques. They showed disagreement just about Not permitting child talk and Passive Immobilization.

In Table 1, comparisons between P1 and P2 showed significant increase in means for Told treatment may involve pain and Sedative, besides significant decrease for Use of euphemisms. Comparing P2 versus P3 and P1 versus P3, it was observed significant increase in student's means and, consequently, in the acceptability, for the same techniques: Voice control, Told not to be coward, Modeling, Blunting, Use of euphemisms, Parent not present, HOME, Active Immobilization, Passive Immobilization, Sedative, Nitrous Oxide and General anesthesia.

Table 1. Student's means ($m \pm sd$) and pairs comparisons, at first- (P1), third- (P2) and eighth- (P3) semesters of Federal University of Paraíba.

Behavior Guidance Technique or Clinical Situation	Means \pm sd			Pair Comparisons*		
	P1	P2	P3	P1-P2	P2-P3	P1-P3
Tell-show-do	8.23 \pm 2.63	8.96 \pm 1.67	9.21 \pm 1.31	NS	NS	NS
Voice control	6.30 \pm 3.14	5.84 \pm 3.37	8.18 \pm 2.88	NS	S	S
Told not to be coward	5.23 \pm 3.11	4.84 \pm 3.57	6.89 \pm 2.79	NS	S	S
Promised a toy	6.93 \pm 2.79	6.40 \pm 3.18	5.25 \pm 3.47	NS	NS	NS
Distraction	8.10 \pm 2.10	8.48 \pm 2.48	9.07 \pm 1.38	NS	NS	NS
Verbal positive reinforcement	9.47 \pm 1.16	9.80 \pm 0.50	9.82 \pm 0.47	NS	NS	NS
Modeling	6.33 \pm 2.92	5.44 \pm 2.93	8.43 \pm 2.36	NS	S	S
Blunting	5.10 \pm 2.99	4.84 \pm 3.30	8.29 \pm 2.38	NS	S	S
Use of euphemisms	8.73 \pm 1.74	6.88 \pm 3.51	9.25 \pm 1.50	S	S	S
Told treatment may involve pain	4.90 \pm 3.17	7.24 \pm 2.27	6.54 \pm 3.15	S	NS	NS
Not permitting child talk	2.23 \pm 2.75	2.56 \pm 2.32	3.11 \pm 2.62	NS	NS	NS
Parent not present	0.83 \pm 1.59	1.64 \pm 2.07	6.29 \pm 2.65	NS	S	S
HOME	2.73 \pm 2.91	2.00 \pm 2.46	6.75 \pm 3.37	NS	S	S
Active Imobilization	1.37 \pm 2.31	2.04 \pm 2.68	6.07 \pm 3.00	NS	S	S
Passive Imobilization	0.17 \pm 0.53	0.56 \pm 0.96	3.14 \pm 3.11	NS	S	S
Sedative	2.33 \pm 2.70	4.04 \pm 2.59	6.04 \pm 2.93	S	S	S
Nitrous Oxide	1.97 \pm 2.44	3.08 \pm 2.67	5.71 \pm 2.99	NS	S	S
General anesthesia	1.03 \pm 2.12	2.04 \pm 2.37	4.64 \pm 3.36	NS	S	S

*Mann-Whitney U test, $p \leq 0.05$, S=significant, NS=not significant

The means are also graphically presented in Figure 2. According to rating of acceptability showed in Figure 1, it was observed that, in all semesters, the techniques Verbal positive reinforcement, Distraction and Tell-show-do were the best accepted ones (means > 8.0 , i.e., classified as total agreement); on the other hand, there was no consensus regarding to the least accepted ones (means > 2.0 , i.e., classified as total disagreement).

Table 2 shows the ranking of students' acceptability for each semester studied (P1, P2 and P3), in increasing order (from 1 to 18, according to the means) and differences between semesters. It was observed that Passive Immobilization was the least acceptable technique by P1 and P2, followed by Parent not present. To P3, the least acceptable technique was Not permitting child talk, followed by Passive Immobilization. General anesthesia was considered the third least acceptable by all students, whereas Verbal positive reinforcement was the most acceptable. Use of euphemisms and Tell-show-do also were well accepted by all students. Differences between BMTs positions

throughout the semesters were also registered in Table 2. Promising a toy registered the largest difference between P1 and P3 (-10), indicating that this technique became less acceptable throughout the semesters, in the same way that Parent not present became more acceptable (+6). General anesthesia, Voice control and Verbal positive reinforcement remained in the same position: 3^o, 12^o e 18^o, respectively.

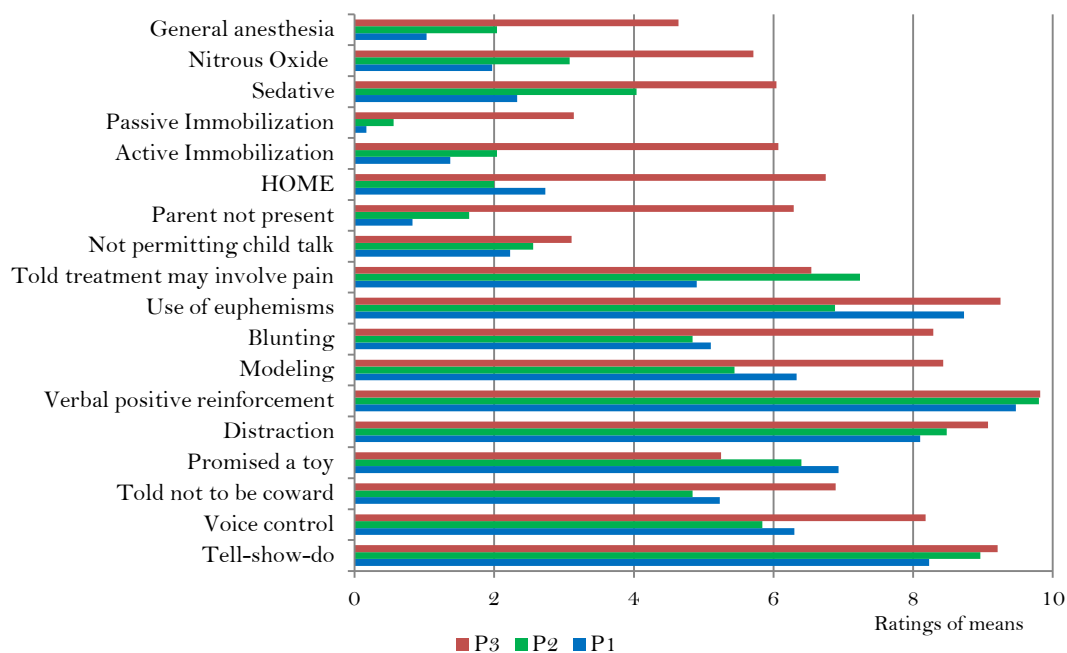


Figure 2. Graphical representation of means acceptability ratings given by student's from first-(P1), third-(P2) and eighth-(P3) semesters of Federal University of Paraíba.

Table 2. Ranking of students' acceptability for behavior management techniques or clinical situations in increasing order and difference between first-(P1), third-(P2) and eighth-(P3) semesters of Federal University of Paraíba.

Behavior Management Technique or Clinical Situations	Ranking by semester			Difference		
	P1	P2	P3	P1-P2	P2-P3	P1-P3
Tell-show-do	16	17	16	+1	-1	0
Voice control	12	12	12	0	0	0
Told not to be coward	11	10	11	-1	+1	0
Promised a toy	14	13	4	-1	-9	-10
Distraction	15	16	15	+1	-1	0
Verbal positive reinforcement	18	18	18	0	0	0
Modeling	13	11	14	-2	+3	+1
Blunting	10	9	13	-1	+4	+3
Use of euphemisms	17	14	17	-3	+3	0
Told treatment may involve pain	9	15	9	+6	-6	0
Not permitting child talk	6	6	1	0	-5	-5
Parent not present	2	2	8	0	+6	+6
HOME	8	4	10	-4	+6	+2
Active Immobilization	4	5	7	+1	+2	+3
Passive Immobilization	1	1	2	0	+1	+1
Sedative	7	8	6	+1	-2	-1
Nitrous Oxide	5	7	5	+2	-2	0
General anesthesia	3	3	3	0	0	0

Discussion

In the beginning of dental graduation, students used to be relatively uninformed about behavior management techniques. Their view could be compared, to a certain extent, to a layperson's opinion. However, the dental curriculum provides didactics classes, including this issue, when students receive directions to deal with children during clinical situations. Moreover, they have opportunity to put it in practice and develop patient management skills, when perform children's treatment at pediatric dentistry clinic. These educational components may change student's views regarding to BMT, since the technique's acceptability is considered in terms of its clinical effectiveness and perceptions of its use [19].

The contact with children and the difficulties found during their treatment may greatly influence on students' opinion [6]. It was demonstrated when first- semester' students (P1) totally disagreed of Parent not present and Active Immobilization, on the other hand, students who had clinical experience (P3) agreed with both. Probably these students had the experience of excluding parents and/or they had to immobilize children, due to disruptive behaviors, to continue perform dental procedures [21]. However, a recent survey conducted with parents observed that most of them would like to decide about their presence in the operatory [22]. Thus, it would be interesting consider, whenever possible, this protocol. Likewise, it was noted that, Blunting, a way to try keeping harmful instruments out of the view of the child, was classified as neutral by P1, whereas P3 totally agreed. They may have judged in that manner because had success using this technique to manage their own patients, evaluating positive outcomes as being more acceptable, as far as negative outcomes were judged as less effective and/or unacceptable.

Indeed, comparing P1 and P3's perceptions, it was observed that eighth-semester students' (P3) agreed with most of the techniques, disagreeing just about Not permitting child talk and Passive Immobilization, indicating that they may be faced this situation and had no good results. Particularly, Passive Immobilization was one of the least accepted techniques by all semesters, what could be attributed to a negative impression caused by observation of passively restrained children [21].

General anesthesia remained in the same position in the ranking of acceptability, being considered as the third least acceptable by all semesters. However, from P1 to P3, it was perceived a gradual and significant increase of the means for sedation, nitrous oxide and general anesthesia (according to rating of acceptability in Figure 1: from total disagreement/disagreement in the first-semester to neutral/agreement in the eighth-semester). This result may be occurred due difficulties in treating children, whose education more permissive at home could reflect in non-cooperation attitudes and behavior problems, becoming necessary the use of pharmacologic techniques to make the treatment possible [23]. Nonetheless, the clinical use of these techniques it is not a routine practice at this university, thus the student's response were probably based on theoretical knowledge. The use of nitrous oxide, sedation and general anesthesia require formal competence and/or specialized equipment, factors that could contribute to the reduced use [24]. But

nevertheless, it would be interesting to incorporate the pharmacological management practices into the routine, since the exposure to these techniques may impact competency and use [25].

It is important to develop learning strategies and training, especially in situations whose patient's behavior is non-cooperative and dental procedures cannot be interrupted. It may improve student self-confidence and their ability to deal with hard situations [3]. A recent study showed that predoctoral students did not feel confident to treat children [26]. The reason was the lack of development of some basic pediatric dentistry clinical skills during their graduation. A survey with graduating classes also found that the previous dental school experience and the mentoring faculty influenced student's specialty choice [27]. These findings show the impact that education plays in the professional's life.

Besides pharmacologic techniques, were also observed significant increase in student's acceptability from P2 to P3 and from P1 to P3 for Voice control, Told not to be coward, Modeling, Blunting, Use of euphemisms, Parent not present, HOME, Active Immobilization, Passive Immobilization, what may indicate, once again, that educational components and clinical experience influenced on the students' views throughout the undergraduate.

Tell-Show-Do is considered the most common BMT used, since most of dentists feel comfortable to apply this method to their patients [4]. In the same way, it was perceived as the most acceptable technique by parents [15,17], children [8,28] and students [19,20], however, in the present study, Verbal positive reinforcement was judged as the most acceptable BMT, followed by Use of euphemisms, Tell-show-do and Distraction.

Previous investigations with third-year dental students' found that the most effective teaching method for learning to manage the difficult patient was simply observation of their instructors in clinical practice [29]. However, the observation would serve just to shape students' attitudes, because to develop skills of stimulate children's cooperative behavior and to have effective interventions, it is also necessary the daily practice. Only when they put in practice a certain technique to manage their own patients, students may be able to evaluate the results and judge if that technique is effective and/or acceptable, basing their practices on evidences. Another study also suggested that there is a correlation between the type of training received and the practitioners' level of comfort/ frequency using the techniques [30]. These findings justify the efforts that dental schools should make to improve student's learning.

There are some limitations to the current study. First, this study is based on a relatively small sample, obtained from three semesters of dental students at a single site. It is possible that results obtained from students in different universities might be different from those reported in this study, which underlines the need for future replications. It is also possible that some respondents, mainly first-semester students, may not have completely understood the definitions of the terms about which they were being queried. However, previously a pilot study was performed with five students of each semester to check the comprehension of questions and everyone affirmed that properly understood.

Though this study provides compelling information, its interpretation is limited to one school curriculum, since the data are cross-sectional. It was assumed that score differences among each cohort (first, third, and eighth semesters) were based on exposure to didactic and/or clinical components; however, it is possible there were also pre-existing differences in perceptions across cohorts.

Conclusion

It was concluded that undergraduate dental education components have the potential to shape student perceptions of pediatric dental behavior management techniques during their career, because of this; professors should take into consideration the potentially significant effects of undergraduate dental education on students' perceptions of behavior management techniques. Moreover, they should recognize that both didactic and clinical educational components may influence on the students' perceptions.

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