

## Dental Students' Perception Towards Behavior Guidance Techniques in Pediatric Dentistry

Samaneh Razeghi<sup>1</sup>, Mohammad Reza Khami<sup>2</sup>, Mahsa Hasani<sup>3✉</sup>, Maryam Mohammadalizadeh<sup>3</sup>,  
Mohammad Javad Kharazifard<sup>4</sup>

<sup>1</sup> Associate Professor, Research Center for Caries Prevention, Dentistry Research Institute, Tehran University of Medical Sciences, Tehran, Iran; Department of Community Oral Health, School of Dentistry, Tehran University of Medical Sciences, Tehran, Iran

<sup>2</sup> Professor, Research Center for Caries Prevention, Dentistry Research Institute, Tehran University of Medical Sciences, Tehran, Iran; Department of Community Oral Health, School of Dentistry, Tehran University of Medical Sciences, Tehran, Iran

<sup>3</sup> Private Practice, Tehran, Iran

<sup>4</sup> Research Member, Dental Research Center, Dentistry Research Institute, Tehran University of Medical Sciences, Tehran, Iran

### Abstract

**Background and Aim:** Management of children's behavior is fundamental to a successful and effective dental treatment for children. This study aimed to evaluate the perceptions of dental students towards behavior guidance techniques in pediatric dentistry.

**Materials and Methods:** This cross-sectional study was carried out on dental students from three different levels of education. A questionnaire containing demographics, perceived acceptability of behavior guidance techniques (17 statements), and clinical situations (8 statements) was completed by the first-year, third-year, and last-year dental students. The questions were scored using a 5-point Likert scale. Descriptive statistics, the linear regression model, and the Chi-square test were used for statistical analysis.

**Results:** Totally, 264 dental students participated in this study. The most acceptable behavior guidance technique and clinical situation were positive reinforcement, and parent present during treatment, respectively. The least acceptable technique and clinical situation were passive immobilization, and showing the needle to the child, respectively. There were significant changes in acceptability scores of some behavior guidance techniques including voice control ( $P=0.00$ ), hand over mouth (HOM) ( $P=0.00$ ), using nitrous oxide ( $P=0.00$ ), positive verbal reinforcement ( $P=0.00$ ), active protective immobilization ( $P=0.00$ ), passive protective immobilization ( $P=0.00$ ), providing exact explanation ( $P=0.00$ ), and general anesthesia (0.02) by increasing the level of education of students.

**Conclusion:** Non-aversive behavior guidance techniques had the most acceptable scores and some aversive techniques like immobilization, disallowing child speaking during treatment, and HOM had the least acceptable scores. Moreover, the higher the level of dental education, the greater the acceptability of some behavioral guidance techniques would be.

**Key Words:** Behavior Control, Pediatric Dentistry, Students, Dental, Perception

✉ Corresponding author:  
Mahsa Hasani, Private Practice,  
Tehran, Iran

mhs.hasani@yahoo.com

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## Introduction

Management of children's behavior is an integral component of pediatric dentistry, and is fundamental to a successful and effective dental treatment for children. Dental practitioners employ behavior guidance techniques to establish communication, reduce fear and anxiety, deliver high quality care, build a trusting relationship between the dentist and child/parent, and promote the child's positive attitude towards oral healthcare. (1-4)

Dental students learn behavior guidance techniques in their theoretical and clinical education. Thus, there are frequent opportunities for the instructors to demonstrate behavioral techniques with potentially long-term impacts on dental students and their practice. (5) Education in the field of pediatric behavior guidance techniques should be adapted to the changing needs and expectations of pediatric patients and their parents. (1, 6-8) To overcome the existing challenges in behavior guidance techniques, the American Academy of Pediatric Dentistry (AAPD) has developed a Guideline on Behavior Guidance for the Pediatric Dental Patients, which identifies both basic and advanced behavior guidance techniques as well as indications for their respective applications. (3) The dental students' perceptions about the behavior guidance techniques have been previously evaluated in first-year dental students. (9) The behavioral management techniques in predoctoral dental students, (5) and the acceptability of these techniques in predoctoral and postdoctoral students (10) have also been studied before. A survey of behavior management techniques in predoctoral pediatric dentistry programs revealed that communicative and pharmacological techniques, except for the hand over mouth (HOM) exercise, were the most acceptable techniques. Also, dental students receive less clinical experience in pharmacological techniques. (11)

To the best of the authors' knowledge, only one study has been conducted in Iran so far on the effect of educational films compared with the conventional behavioral control methods in

pediatric dentistry on the attitude of dental students. In this study, no significant differences were noted in any methods by watching the films. But conventional education led to significant increase in acceptability of voice control, passive restraint and general anesthesia. (12) There is no study in Iran evaluating the awareness or perception of dental students about behavior guidance techniques. Therefore, the purpose of the present study was to evaluate the perceptions of dental students towards the behavior guidance techniques in Tehran University of Medical Sciences.

## Materials and Methods

This study was approved by the Research Ethics Committee of Tehran University of Medical Sciences (IR.TUMS.DENTISTRY.REC.1396.2105). A total of 264 first, third, and sixth year dental students of Tehran University of Medical Sciences participated in this cross-sectional study through census sampling.

The data collection tool was a questionnaire based on similar previous studies. (6, 10) At the end of an educational session, the students were asked to fill out the questionnaire anonymously. In addition to the demographic information (age, gender, year of dental education, having younger siblings, marital status, having children, having a dentist in the family, working in a dental clinic, observing dental treatments in a clinic, having dental, and/or medical experiences, having an unpleasant medical or dental experience, and experience of taking care of children), the questionnaire asked for the students' reactions to 17 statements on behavioral guidance techniques, and 8 statements on behavioral guidance situations, in a 5-point Likert scale from completely unacceptable to completely acceptable. One expert in the community oral health, two experts in pediatric dentistry, and an epidemiologist assessed the validity of the questionnaire. The reliability of the statements was evaluated and approved by performing a test-retest procedure on 15 students. A kappa coefficient of more than 0.7 was calculated for the statements.

The students' answers were scored from 1 to 5. By summing up the scores of the questions, and for better comparison of the scores, the score of each domain was calculated out of 100.

The researcher explained the study objectives to the participants, and informed consent was obtained from them. Participation in the study was voluntary, and all students were ensured about the confidentiality and anonymity of their information.

Data were analyzed using SPSS version 24 (SPSS Co., Chicago, IL, USA) for Windows. To homogenize the scores of behavioral guidance techniques and clinical situations, each section's score was calculated out of 100. The linear regression model was used for statistical analysis. A backward linear regression model was applied to assess the relationship of demographic variables and the acceptability scores. P-values <0.05 were considered significant.

## Results

Totally, 264 dental students participated in this study with a mean age of  $21.91 \pm 3.42$  years. Of the students, 175 (66.3%) were females, 247 (93.6%) were single, and 139 (52.7%) had younger siblings. Of all participants, 88 (33.3%) were in the sixth, 104 (39.4%) were in the third, and 72 (27.2%) were in the first year of dental education. Also, 97% of all had no children and 74.2% of students had no dentist in their family. Working in a dental clinic, and observing dental treatment in a clinic were reported by 79.2%, and 67.8% of all participants, respectively. Also, 84.8% and 90.2% of students reported past dental and medical treatments, respectively; and most of them (67.4%, and 70.1%, respectively) had unpleasant dental, and medical experiences (completely unacceptable to completely acceptable).

The most acceptable behavior guidance techniques were positive reinforcement (90.5%), using music/video distraction (90.2%), and use of euphemisms (90.1%). The least acceptable techniques were passive immobilization (78.4%), disallowing child speaking during treatment (76.1%), and HOM (74.6%)(Table 1).

The most acceptable behavior guidance clinical situations were parent present during treatment (47.7%), and allowing the child to stop the treatment (47.3%). The least acceptable behavior guidance clinical situations were showing the needle to the child (80.3%), and treatment without local anesthetic when it is refused by the child (80.3%)(Table 2).

The mean scores of acceptability of behavioral guidance techniques and clinical situations were  $63.63 \pm 7.15$ , and  $60.67 \pm 9.40$ , out of 100, respectively. The results of the linear regression model showed that there were significant associations between the mean score of acceptability of behavioral guidance techniques with year of dental education ( $P=0.003$ ,  $\beta=0.21$ ), and being a parent ( $P=0.02$ ,  $\beta=-0.14$ ). Moreover, there were significant associations between the mean score of acceptability of behavioral guidance clinical situations with year of dental education ( $P=0.00$ ,  $\beta=-0.26$ ), and working in a dental clinic ( $P=0.01$ ,  $\beta=0.17$ ).

The results of the Chi-square test showed that the higher the year of dental education, the greater the acceptability of some behavioral guidance techniques including voice control, HOM, using nitrous oxide, positive verbal reinforcement, active protective immobilization, passive protective immobilization, providing exact explanation, and general anesthesia would be (Table 3).

## Discussion

In this study, we evaluated the perceptions of dental students towards behavior guidance techniques and clinical situations, and found that non-aversive behavior guidance techniques including positive reinforcement, using music/video distraction, and use of euphemisms were the most acceptable techniques chosen by students. Furthermore, most acceptable behavior guidance clinical situations were parent present during treatment and allowing the child to stop the treatment. Moreover, the results showed that acceptability of some aversive behavioral guidance techniques (like voice control, HOM, and active protective immobilization) and pharmacological behavioral guidance

**Table 1.** Distribution of acceptability of behavioral guidance techniques in pediatric dentistry among dental students (n=264)

N(%)					
	Completely unacceptable	Unacceptable	Neutral	Acceptable	Completely Acceptable
Tell-show-do	2(0.8)	13(4.9)	18(6.8)	129(48.9)	102(36.6)
Disallowing the child to speak during treatment	47(17.8)	154(58.3)	45(17.0)	16(6.1)	2(0.8)
Voice control	46(17.4)	82(31.1)	31(11.7)	87(33.0)	18(6.8)
HOM*	119(45.1)	78(29.5)	31(11.7)	31(11.7)	5(1.9)
Using nitrogen oxide	29(11.0)	43(16.3)	102(38.6)	79(29.9)	11(4.2)
Positive verbal encouragement	0(0.0)	26(9.8)	30(11.4)	136(51.5)	72(27.3)
Active immobilization	51(19.3)	94(35.6)	71(26.9)	46(17.4)	2(0.8)
Passive immobilization	124(47.0)	83(31.4)	40(15.2)	14(5.3)	3(1.1)
Using music/video distraction	4(1.5)	2(0.8)	20(7.6)	109(41.3)	129(48.9)
Positive reinforcement	0(0.0)	8(3.0)	17(6.4)	108(40.9)	131(49.6)
Using the child's imagination	3(1.1)	4(1.5)	24(9.1)	118(44.7)	115(43.6)
Mentioning the possibility of pain	9(3.4)	34(12.9)	66(25.0)	129(48.9)	26(9.8)
Providing exact explanation of treatment	20(7.6)	89(33.7)	68(25.8)	71(26.9)	16(6.1)
Using sedation	7(2.7)	67(25.4)	114(43.2)	68(25.8)	8(3.0)
Using general anesthesia	22(8.3)	88(33.3)	92(34.8)	59(22.3)	3(1.1)
Promising a toy	2(0.8)	13(4.9)	34(12.9)	151(57.2)	64(24.2)
Use of euphemisms	0(0.0)	9(3.4)	17(6.4)	130(49.2)	108(40.9)

\*Hand over mouth exercise

techniques (such as using nitrous oxide and general anesthesia) increased by higher level of education of dental students.

Clinical experience, social trends, parental preferences, and changing standards in pediatric dentistry have impacts on acceptance of behavior guidance techniques. (10) The increased public expectations may influence the implementation of behavior guidance techniques more than clinical efficacy. For instance, Sotto et al. indicated that parents' perceptions may conflict with the implementation of behavior guidance techniques. (9) It is interesting that although the elimination of HOM from the AAPD clinical guidelines (3) led to not using this technique by dental clinicians, this technique is considered as

an acceptable behavior guidance technique by a notable number of AAPD members, and many of them believe that HOM should continue to be recognized by the AAPD (13). However, in this study, the acceptability of aversive techniques such as disallowing the child to speak during treatment and HOM was minimal, which was similar to other studies. (6, 9, 10, 14) It should be noted that increased rate of malpractice complaints and the advances in patient education and patient rights decreased the frequency of use of HOM, and even voice control techniques; these are some reasons that led to the removal of HOM from the AAPD Guideline on Behavior Guidance for Pediatric Dental Patients.<sup>3</sup> Cultural context, community demands, educational contents, and faculty

**Table 2.** Distribution of acceptability of behavioral guidance clinical situations in pediatric dentistry among dental students (n=264)

N(%)	Completely unacceptable	Unacceptable	Neutral	Acceptable	Completely Acceptable
Treatment without local anesthetic when it is refused by child	82(31.1)	130(49.2)	37(14.0)	15(5.7)	0(0.0)
Dentist remains quiet during treatment	39(14.8)	161(61.0)	45(17.0)	19(7.2)	0(0.0)
Allowing child to stop the treatment	4(1.5)	61(23.1)	74(28.0)	112(42.4)	13(4.9)
Modelling	42(15.9)	70(26.5)	59(22.3)	85(32.2)	8(3.0)
Parent present during treatment	9(3.4)	72(27.3)	57(21.6)	114(43.2)	12(4.5)
Parent talks with child during treatment	21(8.0)	81(30.7)	58(22.0)	94(35.6)	10(3.8)
Dentist talks with parent during treatment	16(6.1)	69(26.1)	74(28.0)	99(37.5)	6(2.3)
Showing the needle to the child	136(51.5)	76(28.8)	41(15.5)	11(4.2)	0(0.0)

\*Hand over mouth exercise

members' concepts are some factors which may influence the dental students' perceptions.

In the present study, the most acceptable behavior guidance techniques were positive reinforcement, using music or video distraction, and use of euphemisms. Moreover, the most acceptable behavior guidance clinical situations were parent present during treatment and allowing the child to stop the treatment. The non-aversive nature of these techniques, their consistency with the ethical guidelines and considerations, and the preferences of the parents are among the reasons for high acceptance rate of these techniques. On the other hand, the least acceptable techniques were passive immobilization, disallowing the child to speak during treatment, and HOM. Furthermore, the least acceptable behavior guidance clinical situations were showing the needle to the child and treatment without local anesthetic when it is refused by the child. These findings are similar to those of other studies that generally found that reinforcement and

communicative techniques are at the top of the list of most acceptable methods; while, aversive and pharmacological techniques are at the bottom of the list. (4-6, 10)

First-year dental students may have limited previous exposure to behavior guidance techniques; thus, their perception may be comparable to that of parents. (9) The results of our study confirmed this statement since aversive and pharmacological behavioral guidance techniques had less acceptability among the first-year dental students. The same results were obtained by Fotouhiardakani et al, on parents' attitudes towards different behavioral management techniques for children.<sup>15</sup> They showed that the tell-show-do was the most acceptable technique while aversive (active and passive restraints, HOM, and voice control), and pharmacological (oral premedication and general anesthesia) techniques were the least acceptable.

The effect of dental education on students' perceptions towards pediatric behavior

**Table 3.** Chi-square test results of the acceptability of different behavior guidance techniques and different levels of education in dental students (n=264)

	N(%)			P-value
	1 <sup>st</sup> year	3 <sup>rd</sup> year	Last year	
Tell-show-do	59(81.9)	92(88.5)	80(90.9)	0.51
Disallowing child speaking during treatment	4(5.6)	6(5.8)	8(9.1)	0.14
Voice control	14(19.4)	26(25.0)	65(73.9)	0.00 <sup>†</sup>
HOM*	1(1.4)	9(8.7)	26(29.5)	0.00 <sup>†</sup>
Using Nitrous Oxide	16(22.2)	20(19.2)	54(61.4)	0.00 <sup>†</sup>
Positive verbal encouragement	63(87.5)	71(68.3)	74(84.1)	0.00 <sup>†</sup>
Active immobilization	7(9.7)	7(6.7)	34(38.6)	0.00 <sup>†</sup>
Passive immobilization	3(4.2)	1(1.0)	13(14.8)	0.00 <sup>†</sup>
Using music/video distraction	65(90.3)	89(85.6)	84(95.5)	0.1
Positive reinforcement	65(90.3)	91(87.5)	83(94.3)	0.90
Using the child's imagination	63(87.5)	88(84.6)	82(93.2)	0.36
Mentioning the possibility of pain	41(56.9)	65(62.5)	49(55.7)	0.14
Providing exact explanation of treatment	10(13.9)	36(34.6)	41(46.6)	0.00 <sup>†</sup>
Using sedation	20(27.8)	22(21.2)	34(38.6)	0.36
Using general anaesthesia	13(18.1)	18(17.3)	31(35.2)	0.02 <sup>†</sup>
Promising a toy	58(80.6)	78(75.0)	79(89.8)	0.41
Use of euphemisms	63(87.5)	90(86.5)	85(96.6)	0.13

\* Hand over mouth exercise

† P&lt;0.05

guidance techniques has been investigated before. Bimstein et al. indicated that the level of dental education may have a significant effect on students' perceptions about behavior guidance techniques. (6) By surveying dental students from the first to the fourth year of education, they found a significant increase in acceptability of use of general anesthesia and nitrous oxide. On the other hand, they showed a great reduction in acceptance of the parent speaking with the child during treatment, telling the child that the treatment may involve pain, and the parent's presence in the operatory room or talking to the dentist/assistant during the treatment. Jafarzadeh et al. compared the effect of educational films with theoretical education for instruction of conventional behavior control techniques. (12) They found no significant differences in any method by watching the films. But conventional education led to significant increase in acceptability of

voice control, passive restraint and general anesthesia. The results of the present study indicated that an increase in level of education significantly increased the acceptability of some behavior guidance techniques such as voice control, HOM, using nitrous oxide, positive verbal reinforcement, active protective immobilization, passive protective immobilization, providing exact explanation, and general anesthesia. The differences in the findings of studies can be partly related to the undergraduate dental curricula in different dental schools, which have the potential to shape the students' perceptions about the pediatric dental behavior guidance techniques. Moreover, the role of dental educators and their own perceptions should take into consideration, which have potentially significant effects on dental students' perceptions towards pediatric dental behavior guidance techniques. Furthermore, Bimstein et al. stated that didactic

and clinical educational components may have different influences on the students' perceptions. (6)

It is interesting that voice control and immobilization (passive/active) have relatively high acceptability perhaps because of the reality that in pediatric dentistry we often encounter non-cooperative children whose parents refuse dental treatment under general anesthesia, and these techniques are used as alternatives for other advanced behavior guidance techniques.

In the present study, pharmacological techniques such as general anesthesia and conscious sedation had moderate acceptability in general. This finding may be due to the available facilities and laws in our country which have led to limited usage of these techniques; for instance, using conscious sedation in pediatric dentistry needs some additional skills and should be done in special medical settings.

The findings of this study should be interpreted by considering its limitations. First, the study data were derived from a survey on one dental school in Iran; however, this dental school is one of the oldest and biggest dental schools, and is a pioneer in dental education in Iran. On the other hand, the quality of survey data is dependent on the real responses; like any other self-reported questionnaire studies, our study participants might have given responses according to social norms, which is referred to as social desirability. It might have an effect on the responses and thus, the results most likely represent an optimistic estimation of the actual situation. (16,17) But the questionnaire was adopted from previously designed valid and reliable questionnaires and was tested for validity and reliability.

### Conclusion

In this study, non-aversive behavior guidance techniques acquired the most acceptable scores and some aversive techniques like immobilization, disallowing the child to speak during treatment and HOM gained the least acceptable scores. It was found that the higher the year of dental education, the greater the acceptability of some behavioral guidance

techniques including voice control, HOM, using nitrous oxide, positive verbal reinforcement, active protective immobilization, passive protective immobilization, providing exact explanation, and general anesthesia would be.

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