Children's Attitudes Toward Behavior Management Techniques Used by Dentists

P.N. Kantaputra, DDS, M.S K. Chiewcharnvalijkit, DDS K. Wairatpanich, DDS
P. Malikaew, DDS, PhD A. Aramrattana, MD, PhD

ABSTRACT

Purpose: Many behavior management techniques (BMTs) are used in dental offices. The objective of this study was to evaluate how children felt towards the BMT used in the dental office by using the newly invented "attitude meter."

Methods: Two hundred forty children 6 to 17 years old were selected randomly to participate in the study. Each student was asked to watch 8 video scenes of live BMTs. The BMTs used consisted of: (1) tell-show-do (TSD); (2) rewards; (3) general anesthesia; (4) papoose board; (5) hand-holding; (6) mouthprop; (7) voice control; and (8) hand-over-mouth exercise (HOME). After watching each BMT scene, the children were instructed to express their attitude towards the BMT by drawing a "line of favor"—the newly invented attitude meter.

Results: It was found that TSD and HOME were the most and least favorite BTM, respectively. Those who had dental experience appeared to have worse attitudes. Older and younger children had different opinions towards some BMTs. The older children preferred the papoose board and hand-holding to the mouthprop. All children preferred the use of the papoose board and hand-holding to voice control.

Conclusions: Children appeared to judge a behavior management technique according to the way it looked. The "line of favor" is a reliable tool to measure attitudes of children over 6 years old. (J Dent Child 2007;74:4-9)

KEYWORDS: BEHAVIOR MANAGEMENT, CHILDREN, DENTAL FEAR

Visiting a dentist can easily evoke strong fear reactions and acute anxiety in some children, and even in adults, who have not had positive dental experiences. Children and adults may have similar feelings, but adults are typically more logical and often have developed positive coping skills over time.[1] Children are more likely than adults to respond to their fear and anxiety about dental procedures by crying or screaming in the dental office. Unlike adults, most young children express their own feelings without social pressure. Many diverse behavior management techniques (BMTs) are used in dental offices to assist children in coping with their fears and anxieties and to decrease behaviors such as screaming and kicking that might disrupt the needed dental care.

A number of behavior management techniques have been used and studied in the past, including the following[2]:

1. Tell-show-do (TSD): The dentist explains and shows the child what is to be done. Then the procedure is performed as described.
2. Rewards: A toy is given to the child as a reward for being cooperative.
3. General anesthesia: The child has dental treatment under general anesthesia.
4. Papoose board: The child is wrapped in a physical immobilization device to limit the child's disruptive movements.

Dr. Kantaputra is pediatric dentist, Dentaland Clinic, and an instructor, Department of Pediatric Dentistry, Faculty of Dentistry, Chiang Mai University, Chiang Mai, Thailand; Drs. Chiewcharnvalijkit and Wairatpanich are students, Department of Pediatric Dentistry, Dr. Malikaew is an instructor, Department of Community Dentistry, Faculty of Dentistry, and Dr. Aramrattana is an instructor, Department of Family Medicine, Faculty of Medicine, all at Chiang Mai University, Chiang Mai, Thailand.
Correspond with Dr. Kantaputra at dnpdi001@chiangmai.ac.th

5. Hand-holding: The dentist and/or dental assistants actively immobilize the disruptive child by holding the child's head, hands, and body.
6. Mouthprop: A mouth-opening device used to help a cooperative child keep his or her mouth open. In some clinical situations, however, it is placed in the child's mouth when the child refuses to open it voluntarily.
7. Voice control: With a serious look, the dentist raises the volume and tone of his/her voice to gain the disruptive child's attention.
8. Hand-over-mouth exercise (HOME): The dentist places his/her hand over the crying and disruptive child's mouth. When the hand is placed, the dentist speaks directly into the child's ear and tells the child that the hand will be removed after the noise stops. When the noise stops, the hand is removed and the child is praised.

When children are cooperative, the use of "basic" BMTs such as TSD, praise, and rewards work well to manage child behavior.[2] When children do not cooperate, however, more "stringent" or "aggressive" techniques such as voice control, mouthprop, HOME, papoose board (Olympic Medical Group, Seattle, Wash), or even general anesthesia may be needed to manage the child.[2]

There have been numerous studies on parental attitudes towards the BMTs used in pediatric dental clinics.[3-7] These studies focused on evaluating how parents felt toward the BMTs used to manage their children. Not surprisingly, the least acceptable BMTs for parents were: general anesthesia; papoose board; and HOME. The papoose board (passive physical immobilization) was more acceptable than active immobilization by the dentist.[3,4] Parents who were well informed about the BMT used, however, tended to accept the BMT better than those who were not.[5] The few studies involving children and dental fear have focused on techniques to reduce dental fear.[8-10] The important cause-associated factors in child dental fear appeared to be: general fears; maternal dental fear; and the child's age.[11] There have been no studies, however, on how children feel towards the BMTs used by dentists. Consideration of the children's feelings appears to have been overlooked or even deemed insignificant, even though they are the ones who receive the treatment.

This study's purpose was to evaluate children's attitudes towards the BMTs used in a dental office in Thailand. It was hypothesized that children would like the BMTs that looked easy, positive, or the least intimidating—such as TSD, rewards, and general anesthesia—and would dislike BMTs that looked punishing or intimidating, such as papoose board, mouthprop, HOME, and voice control. An instrument to measure children's attitudes, the "line of favor" (LOF) was developed by the authors of this study. The LOF is an "attitude meter" that allows young children to convey their feelings regarding the various BMTs. Videotapes of the 8 BMTs typically used in dental offices in Thailand were developed and shown to this study's participants. It is believed that this is the first study demonstrating how children feel towards BMTs in dental offices.

METHODS

PARTICIPANTS

Two hundred forty Thai children 6 to 17 years old from 2 elementary schools and 2 high schools in an urban area of Chiang Mai, Thailand, participated in this study. Sixty children from each school were selected randomly to participate in the study. Elementary schoolchildren were assigned into 2 groups: (1) 6 to 8 old; and (2) 9 to 11 years old. High school students were divided into 2 groups: (1) 12 to 14 years old; and (2) 15 to 17 years old. Dividing children into 4 different subgroups was to provide distinct subsets with respect to children's approximate developmental level.[12]

This study was approved by the review board of the Faculty of Dentistry, Chiang Mai University, Chiang Mai, Thailand, and parental consents were obtained.

MEASURES

Two measures were used in this study: a demographic questionnaire; and a measure of the child's attitude toward the BMTs.

DEMOGRAPHIC QUESTIONNAIRE

Children were asked to provide 4 personal demographic data, including: name, gender, age, and previous dental experience. Each participant recorded whether they had or had not been seen by a dentist. The detail of the treatment was not obtained, however, as it was believed that most children or even parents would not remember precisely what kinds of dental treatment they had received.

"LINE OF FAVOR" (LOF), MEASURE OF ATTITUDES

The "line of favor" (LOF) was designed to measure the attitude of the children toward each BMT. Initially, a classic visual analog scale (VAS) was to be used to assess the participants' attitudes towards the BMTs (Figure 1c). A pilot test of the VAS with 10 children 6 to 8 years old, however, revealed that most children in this age group did not understand how to use it. Therefore, the LOF was developed and used to obtain the expressive attitude of the children, since it was easy for them to express how much they liked it (Figures 1a and 1b). LOF was modified from VAS (Fig. 1c). The distance between the left anchor point to the right end of the paper is 10 cm (Fig. 1a). Children were asked to draw a line from the anchor point to the right. The attitude was represented by the length of the line measured in horizontal dimension in centimeters with 1 decimal point (Fig. 1b). The length of the line reflected how much they liked the BMT. Drawing a long line would imply that they liked that BMT very much. On the other hand, if they were not very fond of that BMT they would draw a very short line. The maximum length of the line was 10 cm, representing the maximum score of liking or greatest attitude.

The arbitrary cut points were 3 cm and 7 cm to the right of the anchor point. Even though "liking" something is a continuous variable, the authors needed cut points to decide how to interpret the children's responses. Liking something

less than 30% would reasonably imply a negative attitude towards that particular thing and the opposite for liking something more than 70%. Therefore, a score of:

1. 0 to ≤3 cm means "not very fond of that BMT";
2. >3 to ≤7 cm means "neutral toward that BMT"; and
3. >7 to ≤10 means "like that BMT very much."

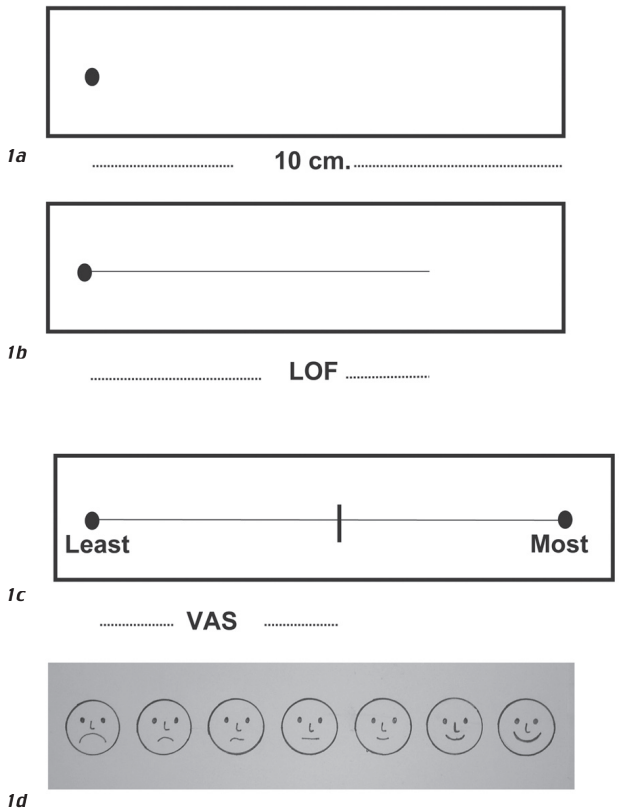

Fig.1a. Line of favor sheet. The distance between the anchor point to the right end of the sheet is 10 cm.

Fig.1b. The length of the line of favor reflects the attitude towards the behavior management technique.

Fig. 1c. Visual analog scale.

Fig.1d. Affective facial scales ranging from "very sad" to "neutral" to "very happy."

Each LOF was on a small page of color paper sized 11.5 x 2.5 cm, and each was on a different color of paper. Not having more than 1 LOF on the same page of paper enabled each LOF drawing to be as independent as possible. Having more than 1 LOF would have allowed the children to compare the present drawing with the previous ones. A pilot study that included 20 subjects 6 to 7 years old indicated that the use of LOF was practical and statistically more reliable than VAS in the young age groups.

LOF VALIDITY AND RELIABILITY

To test the LOF validity and reliability, a pilot test was done using 20 dental students, 17 to 19 years old, from Chiang Mai University. The authors used college-aged students because it was their intention to "test" the tool, not the subjects. The students were requested to do the same test twice by expressing their "liking" towards common things such as coffee, chicken, snakes, and fish by using the visual analog scale (VAS) and the LOF in the first and second tests, respectively. The tests were performed 2 weeks apart to avoid using memory of the first test to answer in the second test. A paired t test showed that there were no significant differences between the use of LOF and VAS ($P>.05$). Using the Pearson's correlation test, there were significant correlations between the use of LOF and VAS ($P<.05$).

For the LOF measuring tool to be reliable, it should provide consistent results when the test is repeated. The test-retest on the "liking" of common things was done a week apart using the LOF in the same group of 20 students 17 to 19 years old. A paired t test showed that there were no statistical differences between the 2 times that the students completed the LOF ($P>.05$), meaning that the LOF was reliable and the results reproducible. Using the Pearson's correlation test, there was a significant correlation between the 2 times that the students completed the LOF ($P<.05$).

VIDEOTAPES OF BMT SCENES

Videotapes of the 8 BMTs being used in practice were recorded in the Pediatric Dentistry Clinic, Chiang Mai University. The BMTs recorded were the real situations. The scenes recorded were chosen with the intention that they would represent "typical" BMT.

The authors have selected these 8 BMTs as they are well known and have been used in dental offices all over the world.[2] The preference of their use, however, depends upon the dentists' knowledge and experience and the culture of the people within their respective societies.

RELIABILITY AND REPRODUCIBILITY OF THE BMT VIDEOTAPE

All BMT videotapes were viewed and evaluated by 6 trained pediatric dentists. Some BMT scenes were redone until there was consensus that all the BMT vignettes accurately depicted the typical use of the technique. The authors decided to divide all BMTs into 3 groups—according to the degree of aversiveness before the children viewed the tapes—as the authors believed that the order in which the videotapes were seen might influence the child's judgment. The 3 groups, from least aversive to most aversive, were:

1. group A: TSD and rewards;
2. group B: mouthprop, voice control, and HOME; and
3. group C: hand-holding, papoose board, and general anesthesia.

The 8 BTM scenes were presented in 6 different sequences based on the 3 BMT groups and were then randomly assigned onto 6 videotapes to minimize the possible bias that could come from viewing particular sequences. Each 17-minute-videotape contained an introduction, including the aim of the study and the nature of using BMTs in clinical practice. Instructions were provided only once at the beginning of the videotape, followed by the examples of each BMT with 20-second-pauses after each BMT for the child to draw the LOF.

The evaluation of the videotaped scenes by LOF was analyzed twice (1 week apart) in 20 children 6 to 8 years old, using the same BMT sequence. The operator in the scenes was not present in the room while the children were doing the test. A paired t test showed no statistical differences between the tests, meaning that the evaluation of the BMT scenes using the LOF was reproducible.

STATISTICAL ANALYSIS

Frequencies and percentages were used to describe the characteristics of the sample, such as: (1) gender; (2) dental experience; and (3) school level. The LOF scores were described in terms of means and standard deviations. The differences of the means of LOF scores among BMTs for gender, dental experience, and school level were analyzed by a multi-way ANOVA. Then, a principal component analysis was used to extract the BMTs into components according to LOF scores. The Kaiser's criterion with an eigen value higher than 1 was the cutoff point to include the number of components in an analysis.[13] The Varimax with Kaiser normalization was the rotation method to get a rotated component matrix.[14]

RESULTS

One hundred twenty elementary students and 120 high school students participated in the study. Among those, 122 were male, 118 were female. Of these students 46 children (19%) had never had a dental experience. Table 1 shows the BMTs and the mean response of the children on the LOF, from most liked (higher scores) to least liked (lower scores). There were statistically significant differences on LOF scores among the BMTs (P<.001).

The most popular BTMs (mean LOF=8.28) were, in order: (1) TSD; (2) rewards; (3) general anesthesia; (4) papoose board; (5) hand-holding; (6) mouthprop; (7) voice control; and (8) HOME.

The least popular BMTs among elementary students were, in order: (1) HOME; (2) voice control; (3) hand-holding; (4) papoose board; (5) mouthprop; (6) general anesthesia; (7) rewards; and (8) TSD.

The most popular BTMs among high school students were, in order: (1) TSD; (2) rewards; (3) general anesthesia; (4) papoose board; (5) hand-holding; (6) voice control; (7) mouthprop; and (8) HOME.

The average LOF score rated by the elementary students (6.16±3.22) was statistically significantly higher than the high school students (5.00±3.21; P<.001). The children who had dental experience rated the LOF scores slightly but significantly lower (5.56±3.26) than those who did not have dental experience (5.66±3.28; P=.002). There was no difference, however, in LOF mean scores between males (5.56±3.28) and females (5.60±3.25).

In addition, an interaction was found between BMTs and school level (P=.03; Table 2). Therefore, a principal component analysis was used to analyze how the schoolchildren rated the LOF scores among the BMTs.

The results showed that there were 2 BMT components (Table 3). Among the elementary schoolchildren, the first BMT component consisted of: (1) HOME; (2) mouthprop; (3) papoose board; (4) voice control; and (5) hand-holding. The second component comprised: (1) general anesthesia; (2) TSD; and (3) rewards.

Among the high school students, the first BMT component included: (1) voice control; (2) hand-holding; (3) general anesthesia; (4) papoose board; (5) HOME; and (6) mouthprop. The second component included: (1) rewards; and (2) TSD.

DISCUSSION

Children's attitudes towards BMTs used in a dental clinic were studied. This appears to be the first study demonstrating how children feel towards BMTs in dental clinics. For all the children, the most popular BMTs were: (1) TSD; (2) rewards; (3) general anesthesia; (4) papoose board; (5) hand-holding; (6) mouthprop; (7) voice control; and (8) HOME. It was found that gender had no influence on the children's attitudes towards BMTs.

The LOF scores rated by the elementary schoolchildren were higher than those of the high school students. This implies that the younger children are more expressive than the older ones. This is understandable, as the older children have more experience in making judgments and are capable of seeing things or making judgment in gradual degrees—unlike young children, who see things as more black and white and discrete.1

A surprising finding beyond the main purpose of this study was that almost 20% of children had never seen a dentist. Dental caries is very prevalent and problematic among Thai children.[15] It is well known that visiting a dentist can be frightening, especially for those who have dental caries and need extensive dental treatment. In addition to having a high caries rate, Thai children are frequently brought to the dentist when they are in pain. Unfortunately, this can lead to a painful dental experience. This may explain this study's finding that children with dental experience rated the LOF scores lower and, therefore, less positively than those who had never had a dental experience. It would have been ideal to analyze the LOF scores with the kinds of treatment the children received. That would have been unreliable, however, as the authors believed that the children and parents would not remember in detail the kind of treatment they received or the number of appointments they had gone through.

HOME was the least popular BMT. Interestingly, this is the same reaction reported by adults, with the majority of parents reporting that they did not consider the use of HOME justified.[3] HOME is not usually used alone, but is coupled with the use of firm commands and "serious" facial expressions. The lack of parental acceptance of HOME is understandable. Placing an adult's hand over a crying child's mouth and issuing a verbal reprimand to stop a disruptive child from crying can seem quite aggressive and unkind. This technique could be misinterpreted as the dentist hurting the child. Its use in the United States has greatly declined.[16]

The present study shows that children liked general anesthesia more than the mouthprop, papoose board, hand-holding, and HOME. This differs markedly from the attitude of parents who knew the risk involved with general anesthesia and accepted it only when extraction was needed.[3] A recent study on attitudes of contemporary parents[17] toward BMTs has showed that parents least accepted these BMTs in the following order: (1) HOME; (2) papoose board; (3) voice control; (4) hand-holding; and (5) general anesthesia.

General anesthesia was likely a preferable BMT for young children in this study because it looked easy and painless and children do not know the associated risks. Elementary students even rated general anesthesia in the same group as TSD and rewards, unlike high school students who rated general anesthesia in the same group as other more aggressive BMTs. It is hypothesized that high school students might have a better understanding of the risks involved in using general anesthesia and, therefore, rated it less favorably compared with the elementary students.

The mouthprop was included as a BMT, even though it is surprisingly not considered to be one by the American Academy of Pediatric Dentistry.[2] The authors believe it is a reasonable BMT for use in dental offices to "manage" the disruptive behaviors of children. The mouthprop was not liked by the high school students, and this may be because it looks quite intimidating and appears to be a device used to force the child to open their mouth against the child's will. In real clinical situations, however, the mouthprop is also passively used in cooperative children to keep the mouth open. It is worth noting that all children preferred the papoose board and hand-holding to the mouthprop. The high school students liked the papoose board, hand-holding, and voice control more than the mouthprop. It appears that the mouthprop may have a very intimidating look or—based on the way it was used in the BMT scene to force the child to opening his mouth—as "cruel" or "unkind".

Neither elementary nor high school students liked the use of voice control or "firm" verbal instruction with "serious" facial expressions, even though it is verbal and not physical. This is not surprising, given that children do not like anyone to "raise the tone of voice" or "yell" at them. voice control has sometimes been considered a punishment technique.[18] Loud voice and hand slapping are considered aversive stimuli for children and have been used to suppress their unwanted behavior.[19,20] Actually "loudness" does not always achieve its objectives, as a teacher's softly but firmly spoken commands can often be more effective than loudly spoken commands.[21] The expression "how you say it is more important than what you say" appears to support this concept.

Elementary and high school students alike preferred the papoose board over hand-holding. This was probably due to the more "secure look" of the papoose board and the more "aggressive" look of hand-holding. This is in contrast to the adults, who did not consider the use of the papoose board to be justified, except for emergency extractions.[3] It is surprising to note that children appeared to prefer the physical restraining techniques—papoose board and hand-holding—over voice control. This could mean that children really hate to be "yelled" at.

It was also found that, in some aspects high school students thought differently than elementary students. This supports the concept that high school students 12 to 17 years old are in Piaget's formal operational stage of thinking, have the ability to see new kinds of logical relationships, and are richer in their conceptual abilities. These adolescents are more proficient at logical and abstract thought. Maybe this was what the elementary students who were in Piaget's concrete operational stage did not have and which made them think differently.[1]

This pilot study demonstrated that children under 6 years old are not capable of using VAS. It appears that they are not yet capable of translating the perception into the expression. LOF is more user friendly than both conventional VAS (Fig. 1c) and the affective facial scale representing facial expressions ranging from "very sad" to "neutral" to "very happy" (Fig. 1d). The downside of affective facial scales is that the score is not emotionally continuous and children may have bias towards the faces.[22,23] It is interesting to note that measuring the attitudes of children younger than those in this study's age group (5 years old) has been reported. It is believed that 5-year-old children could be "trained" to do VAS or affective facial scales.[12, 24,25]

In this study, the authors presented the instructions to the younger children in the same way they told the older children, which could have made the difference. The other aspect that could have made a difference is that Thai children are not used to making judgments, unlike those in the western world.

There are limitations to the present study. Theoretically, there are no standard BMTs, especially for voice control and HOME. It has to be admitted that the way pediatric dentists manage patients are different and that they do not behave exactly the same toward different patients. Sometimes dentists do not even "act" the same to the very same patient twice. A philosophy of the techniques themselves, however, should be carefully held. This kind of limitation has to be accepted in the psychological research because dentists are dealing with human behavior. Additionally, when the children evaluated the videotaped scenes, the authors cannot be certain that they were evaluating the technique or the reaction of the children in the scene, as the children's reactions could have been more dramatic and interesting. Lastly, as the authors studied a wide age range, the younger and older children might have viewed the behavior scenes differently. The younger age group, which was cognitively more egocentric, might think of themselves as the patients in the scenes, unlike the older ones. This might have affected the LOF scores.

CONCLUSIONS

Based on this study's results, the following conclusions can be made:

1. The hand-over-mouth exercise (HOME) is the least acceptable behavior management technique (BMT) for children, who did not like any BMT that appeared to

be particularly intimidating.
2. Children, especially the younger ones, seemed to judge things by the way they look, demonstrating the differences in attitudes towards BMTs between the young and older children.
3. Line of favor is a reliable attitude meter for children over 6 years old and could be used in measuring the attitude of adults as well.
4. There is a clinical application of this study's outcome, as it is always good to know how patients feel about what pediatric dentists do and to understand why they respond the way they do.

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