Comparison of Spanish and Portuguese Parental Acceptance of Behavior Management Techniques in Pediatric Dentistry

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Aim. T*o compare acceptance of behavior management techniques used in pediatric dentistry by Spanish and Portuguese parents.* ***Study design.*** cross-sectional study.

A survey of 8 behavior management techniques used in pediatric dentistry was administered to parents whose children were being treated at the Universitat Internacional de Cataluña (Barcelona, Spain) or at the Universidade de Coimbra (Portugal). The techniques evaluated were: tell–show–do (TSD), nitrous oxide sedation, passive restraint using a papoose board, voice control, hand-over-mouth, oral premedication, active restraint and general anaesthesia. The questionnaire also included information on parents' sex, number and sex of children receiving treatment, parents' previous dental experience (positive or negative), children's previous dental experience (positive or negative), and the socioeconomic status of the families. ***Results.*** *TSD and voice control were rated the most acceptable techniques in both Spain and Portugal, whereas the least accepted techniques in both countries were active and passive restraint. There were no significant differences in the acceptance of each of the techniques, in relation to parents' sex or their previous dental experience, children's sex or age, children's previous dental experience, or families' socioeconomic status.* ***Conclusion.*** *TSD was the most widely accepted behavior-management technique by Spanish and Portuguese parents, even with the passage of time. Both groups of parents had a low opinion of active and passive restraint techniques.*

Keywords: *Behavior management, pediatric dentistry, parental attitude.*

INTRODUCTION

Dental fear/anxiety in children can often lead to uncooperative behaviors that pose challenges for dentists in the clinical setting[1]. One study found that, among a group of 118 children aged 48–71 months with no previous dental experience, 75.6% showed some degree of anxiety before clinical examination and dental prophylaxis[2]. As many as 22% of children seen by pediatric dentists reportedly present management difficulty[3]. Therefore, managing anxious children is one of the most challenging aspects of pediatric dentistry[4,5].

The "pedodontic triangle" is equally divided between children, parents and dentists, and a permanent dialogue is necessary between all parts of the triangle for effective delivery of dental care[6-8]. To achieve children's cooperation during dental treatment, it is necessary to modify or influence their behavior. Hence, different behaviour management techniques have been developed to facilitate communication with pediatric patients, while simultaneously eliminating inappropriate behavior[9]. Nearly a quarter of children seen by pediatric dentists present with management difficulties[3]. The American Academy of Pediatric Dentistry (AAPD), divided the behavior management techniques (BMTs) into 2 categories: basic behavior techniques and advanced behavior techniques[10]. The former include communication techniques such as: tell–show–do (TSD),

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distraction, positive reinforcement, nonverbal communication, voice control (VC), parental presence/absence, and nitrous oxide/oxygen inhalation. Unfortunately, there is a small percentage of children who cannot be managed through basic BMTs, and these children need alternative techniques[11]. The AAPD acknowledges the need for advanced BMTs, which include protective stabilization (active and passive restraint), sedation, and general anaesthesia (GA). The AAPD Clinical Guideline on Protective Stabilization for Pediatric Dental Patients states that active immobilization involves immobilization by another person, such as a parent, dentist, or dental auxiliary. It defines passive immobilization as the use of a restraining device like a Papoose Board® (PB) (Olympic Medical Co., Seattle, WA, USA)[12].

It is important to inform the parents of the detail of the BMTs that the dentist intends to use, because informed parents are significantly more accepting of BMTs than uninformed parents[1,7,13-15]. Badrawy[16], Frankel[17], and Peretz[7] report that parents accept more BMT once they have had personal experience of it with their own child. Many studies have demonstrated positive changes t[3,7,18-23]. Viability of and access to BMTs, acceptance by parents, legal aspects, and ethical considerations are factors that have made these changes possible. The acceptability of a BMT depends, among other factors, on children's needs at the time of treatment, as well as the type and urgency of treatment (e.g., pain or dental trauma). These influences both the selection of a particular technique and parental acceptance of that technique[5,24,25].

Casamassimo[26] concluded that today's parents are overprotective and less tolerant than previous generations of any suffering their child might experience in a dental procedure. Children tend to cry more now than they did in the past. The study places the blame on poor parental care, divorce, and other social factors. As a result, the use of effective BMTs and pharmacological techniques has increased considerably over the years[5]. In the US Patel *et al* [25] concluded that physical restraint and hand-over-mouth (HOM) were the least-accepted techniques, while GA ranked third on the list of the most accepted techniques. Changes in oral medication used for sedation, with increased safety profiles and efficacy, may also have contributed to its increasing acceptance. Overall, parents may perceive oral sedation and GA to be less risky, more cost-effective, more comfortable for their children, and more convenient than in the past, leading to an increase in their acceptance[5,25].

Few studies in recent years have explored why parents may find one technique more acceptable than another, and none of these involved the Portuguese population. Greater knowledge in this area could lead to better dentist–parent communication, better parent education, and ultimately better care of the child[27]. The aim of the present study was to re-evaluate the acceptance of BMTs used in pediatric dentistry by Spanish parents and compare this with acceptance by Portuguese parents.

MATERIALS AND METHOD

This cross-sectional study was conducted in the University Dental Clinic of the Universitat Internacional de Catalunya (Barcelona, Spain) and the Dental Clinic of Faculty of Medicine of University of Coimbra (FMUC) (Coimbra, Portugal) between January 2018 and July 2019. The project was evaluated and approved by the Ethics Committee of the Universitat Internacional de Catalunya, Sant Cugat del Valles, Barcelona, Spain (Approval Reference: TFG-2016/2017-85) and reinforced by the Ethics Committee of Faculty of Medicine of University of Coimbra, Portugal. The study was carried out in compliance with the Declaration of Helsinki as well as the International Conference on Harmonization Guideline for Good Clinical Practice.

For the study to be statistically significant and to provide valid results for daily clinical practice, and based on previous studies[1,5,7,23,25,] we required a sample of 100 parents (50 Barcelona, Spain/50 Coimbra, Portugal) of children aged 3–14 years who received dental treatment at the aforementioned clinics. The exclusion criteria were: children with mental or physical disabilities, and children receiving pharmacological treatment for a chronic disorder. All parents or guardians of the children participating in the study gave their informed consent before recruitment and were provided with a fact sheet detailing the nature of the study. The information provided was the same for both groups, in Spanish for the parents in Barcelona and in Portuguese for the parents in Coimbra.

Demonstration of BMTs

After each child's medical history had been taken, the parents were invited either alone or in groups to a previously reserved classroom, and shown a 12-min video that demonstrated and explained each of the BMTs used in pediatric dentistry. After the video, the parents were given a questionnaire in which they were asked to evaluate each of these techniques. The video shown to parents was the same as that used by Eaton *et al* [22] and de León *et al* [23], and approved by the AAPD. The original video was produced by Lawrence *et al* [13] and consisted of vignettes of actual treatment appointments. Each vignette showed a child in the dental chair and focused on the specific BMT being evaluated. First, the BMT title was shown; then a video dialogue that had been translated into Spanish or Portuguese and offered parents an explanation of what each BMT involved, according to the current clinical guidelines of the AAPD[10], and European Academy of Pediatric Dentistry[28]; and finally, a visual demonstration of the BMT.

Questionnaire

Data were collected through an anonymous questionnaire similar in form to those used by Eaton *et al* [22], de León *et al* [23], and Boka *et al* 29, in which parents indicated their opinion regarding the different BMTs used during dental treatment. The questionnaire also included information on parents' sex, number and sex of children receiving treatment, parents' previous experience of dental treatment (positive or negative), children's previous experience of dental treatment (positive or negative), and families' socioeconomic status.

Rating

The parents evaluated each of the techniques shown in the video on a scale of 0 to 10, with 0 meaning that they were completely opposed to the technique, and 10 that they totally accepted the technique. The BMTs assessed were shown in the following order: TSD, sedation with nitrous oxide, passive restraint using a PB, VC, HOM, oral premedication, active restraint by dental staff, and GA.

Parental background

The socioeconomic status of the parents was assessed by asking them to reveal their annual family income, which was classified as: low, <€9,000; average €9,000–30,000; or high, ≥€30,000.

Statistical evaluation

All data were analysed using Statgraphics® Plus Version 5.1 (Statpoint Technologies, Warrenton, VA, USA). Comparative diagrams and graphs were created using the analysis of variance (ANOVA) multifactorial system, and the Mann–Whitney U test was used to check the heterogeneity of 2 ordinal samples, expressed as percentages. A value of $p \leq 0.05$ was considered to be statistically significant.

RESULTS

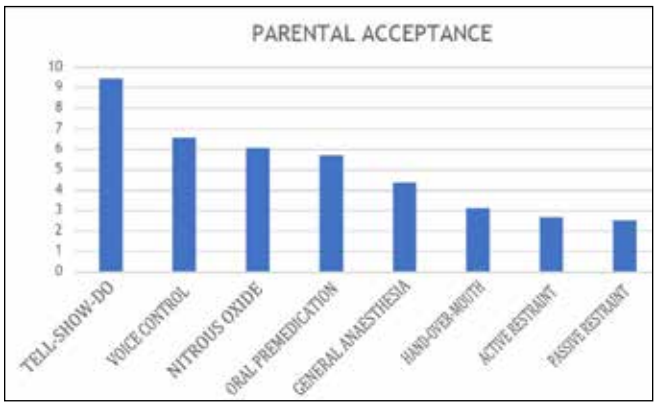
All 100 parents who were invited to participate agreed to complete the questionnaires. All the children had previously undergone dental treatment.

Spanish sample

There were 50 parents at the Universitat Internacional de Catalunya, Barcelona: 30 women (60%) and 20 men (40%). Socioeconomic status was high (n=15; 30%), average (n=29; 58%) or low (n=6; 12%). Parents' previous dental experience was positive for 46 (92%) and negative for 4 (8%). There were 69 children: 39 girls (56.5%) and 30 boys (43.5%); 23 (33.3%) aged 3–6 years, 32 (46.4%) aged 7–10 years and 14 (20.3%) aged 11–14 years. Previous experience of dental treatment was positive for 61 (88.4%) children and negative for the remaining 8 (11.6%).

TSD was the most accepted BMT, followed in decreasing order of acceptance, VC, nitrous oxide sedation, oral premedication, GA, HOM, active restraint, and finally, passive restraint (Figure 1). There were no significant differences (p=0.96) in the acceptance of each BMT in relation to the parents' sex or previous dental experience (p=0.18). There were no significant differences in the acceptance of each BMT in relation related to sex of firstborn children (p=0.35) or second/thirdborn children (p=1.0), age of firstborn children (p=0.52) or second/thirdborn children (p=0.91), or children's previous dental experience (p=0.47). Finally, there were no significant differences (p=0.87) in terms of the acceptance of each of the techniques, as far as they were related to socioeconomic level.

Figure 1. Level of parental acceptance of different BMTs by Spanish parents.

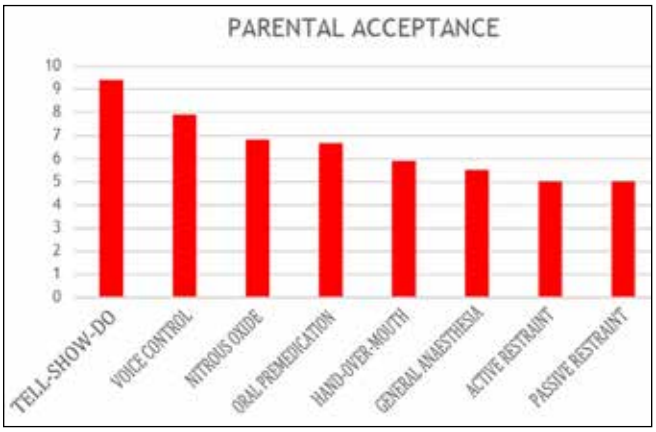


Portuguese sample

50 parents took part in the study at the Faculty of Medicine, University of Coimbra: 37 women (74%) and 13 men (26%). Socioeconomic status was high (n=3; 6%), average (n=24; 48%) or low (n=3; 46%). Parents' previous dental experience was positive for 48 (96%) and negative for 2 (4%). There were 65 children: 34 girls (52.3%) and 31 boys (47.7%) aged 3–6 years (n=17; 26.2%), 7–10 years (n=28; 43.1%) and 11–14 years (n=20; 30.7%). Previous experience of dental treatment was positive for 59 (90.7%) children and negative for the remaining 6 (9.2%).

TSD was the most accepted technique, followed by VC, nitrous oxide sedation, oral premedication, HOM, GA, and finally active and passive restraint using the PB (Figure 2). There were no significant differences in the acceptance of each technique in relation to parents' sex (p=0.40) or their previous dental experience (p=0.12). There were no significant differences in the acceptance of each technique in relation to sex of firstborn children (p=0.62) or second/thirdborn children (p=0.14), age of firstborn children (p=0.89) or second/thirdborn children (p=0.46), or children's previous dental experience (p=0.90). Finally, there were no significant differences (p=0.17) in terms of the acceptance of each of the techniques, as far as they were related to socioeconomic level.

Figure 2. Level of parental acceptance of different BMTs by Portuguese parents.



Comparison between Spanish and Portuguese groups

Table 1 shows the mean and median scores and standard deviation (SD) for each BMT. Significant differences ($p \leq 0.05$) were found between the groups in the parental perception of the following BMTs: VC (p=0.004), HOM (p=0.0001), active restraint (dental staff) (p=0.001), and passive restraint (PB) (p=0.001). We did not observe significant differences ($p \geq 0.05$) between the groups in parental perception of the following BMTs: TSD (p=0.83), sedation with nitrous oxide (p=0.18), oral premedication (p=0.11), and GA (p=0.24).

Table 1. Parental acceptance of BMTs. *Statistically significant.

Parental acceptance	Spanish sample (n=50)			Portuguese sample (n=50)			
	Mean	Median	SD	Mean	Median	SD	P-value
TSD	9.46	10.0	1.05	9.38	10.0	1.30	0.83
Nitrous oxide	6.06	7.0	3.40	6.8	8.0	3.33	0.18
Passive restraint	2.52	1.0	3.09	5.02	5.5	3.95	0.001*
VC	6.56	7.0	2.76	7.9	9.0	2.85	0.004*
HOM	3.12	2.0	3.23	5.88	7.0	3.34	0.0001*
Oral premedication	5.7	6.5	3.37	6.68	8.0	3.44	0.11
Active restraint	2.66	1.5	3.24	5.02	5.0	3.55	0.001*
GA	4.38	4.0	3.95	5.5	8.0	4.13	0.24

DISCUSSION

In this study, we examined the parental preference of 8 of the AAPD-described BMTs in Barcelona, Spain and Coimbra, Portugal. The most accepted technique was TSD, as found in most previous studies[7,8,13,15,18,22,23,29,30]. The high rating for TSD was expected, because it is among the safest and least invasive BMTs and its acceptability appears stable over time[22,31,10,12]. The second most accepted technique was VC, which obtained a high score in both groups. The similar results obtained in the two groups suggest a degree of cultural parallelism in these neighbouring European countries.

In line with other studies[1,5,7,13,25,29] (Table 2), passive restraint was ranked the least acceptable advanced BMT in Spanish and Portuguese groups. Compared with the results obtained 10 years ago at the same Spanish University[23], there has been little change in parental opinion, with passive restraint being in penultimate position. Passive restraint using a PB is a controversial technique among clinicians, since it has been suggested to have the potential of serious consequences, such as physical or psychological harm, loss of dignity, and violation of a patient's rights[12,31]. Active and passive restraint can be used in specific situations such as dental emergencies of short duration, in cases where the child does not cooperate sufficiently for treatment[32]. Some devices used for restraint such as the PB are even forbidden altogether in Nordic European countries[28]. Active restraint was more acceptable than passive restraint for the parents, probably because they perceived active restraint to be a type of assistance to guide the child during dental treatment. This is important in the clinic to perform proper counselling for the indications, risks and benefits of the technique and to obtain informed consent prior to use[5,25]. The main variation obtained after re-evaluation of the techniques for the Spanish parents was in relation to active restraint, given that it has changed from being the third most accepted technique 10 years ago[23] to being in penultimate position in the present study.

The selection of BMTs should be made in consultation with parents, as they play a crucial role in successful dental management of their children. Informed parents are significantly more accepting of BMTs than uninformed parents are[13-15]. Most parents, when in possession of the relevant knowledge, make good decisions for their children. Parental acceptance of BMTs depends largely on how the techniques are framed; proper presentation and explanation allows parents to understand the need and rationale for the use of different techniques[7,22,29]. Therefore, it is important to recognize which of the various techniques are acceptable to parents and to identify factors that influence approval or disapproval of a particular technique[1]. A study conducted in Jordan revealed that most parents refused nitrous oxide sedation and GA because they did not have a clear understanding of the benefits and risks of these techniques, and possibly also because of its high cost and because it was not covered by health insurance[30]. Therefore, dentists should always communicate with parents and explain the pharmacological technique in detail to increase parental acceptability[5,33]. Other factors, such as past experience with BMTs and the type of treatment required for the children, may also influence parental acceptance of the techniques[3,9,26]. The acceptance of the techniques is greater when applied in emergency treatments[5].

Although the acceptance ranking of the BMTs was similar in the two countries, significant differences were found regarding VC, HOM, active restraint (dental staff), and passive restraint (PB), with considerably higher scores among Portuguese parents. The difference in socioeconomic status (12% low socioeconomic status in Spanish parents vs 46% low socioeconomic status in Portuguese parents) resulted in the Portuguese parents scoring higher overall for all the BMTs, even when they were not entirely in agreement, out of professional respect for pediatric dentists. This was in agreement with Lawrence *et al* [13] and Elango *et al* [27], who found that parents of low socioeconomic status may be more accepting of professional opinion and less likely to express dissatisfaction with a procedure.

As in previous studies, no association was been found between acceptance and sex of parents[7,13,18,22,23,29,34] or children[23,29,34]. Previous dental experience of the Spanish and Portuguese parents and children was not significantly associated with acceptance of specific BMTs, and this agrees with results of other studies[7,23,29]. There were no significant differences in terms of the acceptance of each of the techniques, as related to socioeconomic level in Spanish and Portuguese parents. There are some controversial findings concerning parental acceptance and educational level and socioeconomic status[7,22,23,27,34]. Sheller[35] found that parents with a high socioeconomic status increasingly request that their children undergo GA for any dental procedure. This may be because they claim that their child cried on their previous visit, but they are unaware of the indications, risks, benefits, limitations and costs of anaesthesia or sedation. Also, Havelka *et al* [14] concluded that parents with low socioeconomic status are less accepting of more aggressive techniques, such as GA. However, the study carried out at Universitat Internacional de Catalunya (Barcelona, Spain) 10

Table 2. Results of recent studies showing ranking of acceptance of different BMTs between 2005 and 2019.

Eaton et al. [2005]	Luis et al. [2010]	Peretz et al. [2013]	Boka et al. [2014]	Patel et al. [2016]	Chang et al. [2018]	Al Zoubi et al. [2019]
1. TSD	1.TSD	1. Positive reinforcement	1.TSD	1. Nitrous oxide	1. Positive reinforcement	Normal treatment
2. Nitrous oxide	2. VC	2. TSD	2. Parental presence/absence	2. GA	2. TSD	1. Nitrous oxide
3. GA	3. Active restraint	3. Modelling	3. Nitrous oxide	3. Active restraint	3. Distraction	2. Active restraint
4. Active restraint	4. Nitrous oxide	4. Relaxation/ hypnosis	4. VC	4. Passive restraint (papoose board)	4. Parental presence/absence	3. GA
5. Oral premedication	5. GA	5. Sedation	5. Active restraint		5. Nitrous oxide	4. Passive restraint
6. VC	6. Oral premedication	6. Voice control	6. HOM		6. Nonverbal communication	Emergency situations
7. Passive restraint (PB)	7. Passive restraint (PB)	7. Restraint	7. Sedation		7. Conscious sedation	1. Nitrous oxide
8. HOM	8. HOM		8. GA		8. GA	2. GA
			9. Passive restraint (PB)		9. VC	3. Active restraint
					10. Protective stabilization	4. Passive restraint

years ago showed that parents with high socioeconomic status were less ready to accept PB, active restraint, oral premedication or AG[23]. Patel *et al* [25] found less acceptance of sedation and GA as their cost increases. The cultural and economic characteristics of each country may condition the acceptance of each technique.

The parents evaluated each of the techniques shown in the video on a scale of 0 to 10, with 0 meaning complete opposition to the technique and 10 meaning total acceptance. It was decided to use this scoring system, since it is the most common way of grading tests in Spain and Portugal, meaning that it was as objective as possible, given parents' familiarity with it. Other authors have used different assessment scales. Elango *et al* [27, Patel] *et al* [25, Chang] *et al* [1] and Desai *et al* [15] used the visual analogue scale (VAS), and Al Zoubi *et al* [5] used a 5-point Likert-type scale. However, Spanish and Portuguese parents are not familiar with these assessment scales, which may have made it more difficult to choose the appropriate answer.

One of the limitations of this study was that the order of appearance of each of the techniques was always the same, following the order of the original video of Eaton *et al* [22] and that used at the same University 10 years ago[23]. Studies have shown that the order in which the BMTs are presented influences parental acceptance[7,25,33]. Patel *et al* [25] found that when passive restraint was shown last, it was rated less acceptable than when it was shown first. Future studies may consider presenting the BMTs in a different order to examine a broader range of parents and responses. However, it was decided not to change the order of appearance of the techniques, despite the limitation that this implies, so that the re-evaluation of the techniques of the Spanish sample and subsequent comparison 10 years later would be the most reliable possible.

As shown in Table 2, the low acceptance of active and passive restraint techniques and the HOM technique has been demonstrated in each of the studies carried out during the last 15 years. In addition, HOM is a controversial technique and has not been included in the AAPD guidelines since 2006, nor has it ever been in favor in some European countries[12,31]. Future research should focus on assessing parental acceptance in techniques that have not previously been evaluated among Spanish and Portuguese parents, such as distraction, parental presence/absence, positive reinforcement, non-verbal communication, mouth prop and modelling, to assess whether they have the same levels of acceptance as in populations of other countries and cultures.

CONCLUSION

According to our results, TSD was the most widely accepted technique by Spanish and Portuguese parents, even with the passage of time. Both groups of parents maintained a low opinion of active and passive restraint techniques. Parents' sex, their previous dental experience, sex and age of the children treated, and children's previous dental experience did not influence acceptance of each technique by the parents in either country, nor did socioeconomic status.

Conflict of interest

The authors declare no conflict of interest.

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