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ORIGINAL RESEARCH

Students' perception of protective stabilization of pediatric dental patients: a qualitative study

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Abstract

Protective stabilization (PS) has been utilized to safely perform examinations, make diagnoses and/or provide limited treatment of short duration to uncooperative children. The literature supports PS as an alternative technique when behavior management strategies are not sufficient to enable oral care. The use of PS in pediatric dentistry can be traumatic for patients, parents and the medical team and has sometimes been described as being non-compliant with standards of care. Semi-structured qualitative interviews on dental students' perception of PS were conducted in the pediatric department of dentistry at the University Hospital of Toulouse, France. A thematic analysis of the transcript of interviews was provided using the NViVo software. This analysis identified four main themes. The students described their first experience with physical restraint in pediatric dentistry and wondered about the definition of PS. The students' perception of PS showed that this procedure has a psychological impact and is disturbing. There is a lack of information on PS in dental curricula and didactic and clinical education which requires attention. Finally, the students took into consideration the role of PS in future practice. Dental students' perception of PS provides justification for the development and improvement of theoretical and clinical education in behavior guidance techniques for pediatric dental patients, in accordance with national and international guidelines.

Keywords

Physical restraint; Pediatric dentistry; Qualitative study; Student; Dental care; Child

1. Introduction

Working with uncooperative children is considered one of the major challenges in pediatric dentistry because the clinical and management skills of the dentist are truly challenged [1]. In general, behavioral problems during dental care are related to fear, anxiety, past dental experiences, the child's intellectual and emotional characteristics and parental factors, such as the child-parent relationship and parental anxiety. It is important for dentists to master a wide range of behavior guidance techniques to meet the needs of the individual child. The American Academy of Pediatric Dentistry (AAPD) has issued a set of guidelines on behavior guidance in relation to pediatric dental patients [2].

There are various pharmacological and non-pharmacological behavior management techniques aimed at establishing communication, alleviating fear and anxiety, building a trusting relationship between dentist/staff and child/parents, and promoting children's positive attitude toward dental care [3]. Non-pharmacological behavior management employs a spectrum of methods ranging from simple communication techniques such as tell-show-do, and positive reinforcement, to more advanced techniques such as the hand-over mouth procedure and protective stabilization (PS). These techniques are usually used in combination either simultaneously or alternatively. PS is an advanced behavior guidance technique utilized in pediatric dentistry to physically limit the movements of a patient's head, body and/or extremities, either by a person (active PS) or by restrictive equipment (passive PS) with or without the patient's permission, for a finite period of time. This restraint is applied in dentistry when immediate diagnosis and/or urgent limited treatment is needed for uncooperative pediatric patients, especially when sedation or general anesthesia are not accessible [2, 4, 5]. Due to improvements in alternative behavior guidance methods, physical restraint provokes debate among the healthcare community and parents [6–9]. Despite the fact that it might be a part of daily practice in pediatric dentistry, according to the literature, PS still remains a controversial subject and there are divergent opinions regarding the indication, potential risks and acceptability of PS [10, 11].

In this context, in a previous qualitative study we described dentists' perception of the use of PS in pediatric dental care [12]. This study provided a description of the reasons for using or not using PS and the impact of its use on practitioners. The dentists described negative feelings when using physical restraint. "Uncomfortable", "unpleasant" and "taxing on the

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nerves" were notions found throughout the interviews and were often associated with a feeling of failure. Our study was consistent with the qualitative study by Ilha *et al.* [10] on mothers, psychologists and pediatric dentists' perception of PS. The three groups admitted having negative feelings, but caregivers understood, accepted and recognized the importance of physical restraint during dental care. In addition, other qualitative studies were conducted with nurses on a pediatric unit in France [13] and on intensive care units [14]. Despite being "blinded" to the care, several emotions were highlighted such as sadness, guilt, compassion/pity for the patients, as well as anxiety, anger and frustration.

Dental students receive theoretical and clinical training in behavioral guidance techniques at university. The effect of education on dental students' perception of behavior guidance techniques in pediatric dentistry has been previously investigated in various dental curricula [15]. However, the perception and acceptability of PS among dental students have not yet been evaluated. Therefore, the aim of this study was to describe these aspects of the use of PS during pediatric dental care through a qualitative study.

2. Method

This study adheres to the Standards for Reporting Qualitative Research.

2.1 Participants

Eleven (11) fifth- and sixth-year dental students were interviewed between October 2019 and January 2020 at the University Hospital of Toulouse, France. The pediatric dentistry curriculum includes pediatric dentistry lectures in the first three years, followed by hands-on sessions and clinical rotations in the fourth, fifth and sixth years. These rotations include care of healthy cooperative children in a pediatric dental clinic under the supervision of a pediatric dental specialist who is a member of staff, as well as observation or assistance of a pediatric dental specialist caring for uncooperative children. A call for participation was launched to private groups on the faculty dental students' social networks. Any student who had participated or witnessed care under physical restraint could participate. Eight women and three men were interviewed.

2.2 Data generation

Eleven (11) interviews were required for thematic saturation. The interviews were conducted face-to-face in a separate room in the dentistry department of the University Hospital of Toulouse, France. The interviews took place during working hours and were tape-recorded. The conversations were conducted in French. The study was carried out using the qualitative content (thematic) analysis method [16]. Based on a review of the literature and discussions among the investigators (MC, MCV, MM), an interview guide including a short list of questions was developed to assist with the discussions. This guide was modified to take account of the first interviews according to a hypothetico-deductive method. Questions used in this guide pertained to the following: a definition of PS, the situations in which students had been confronted with physical restraint, their feelings about PS and the role of this technique in their future practice.

2.3 Analysis

A thematic analysis of the verbatim records of the individual interviews was carried out using an inductive deliberative-type approach as follows [16, 17]. First, there was an interview debriefing (AM, MM and MCV), the interview recordings were transcribed, and all identities were hidden. All transcripts were imported into the NVivo software (12 pro, international QDR, Cambridge (MA), USA) to facilitate analysis and were coded. The initial codebook was developed iteratively by the three researchers AM, MM and MCV. The initial themes were then generated and collapsed to form key themes in order to decipher the data. The validity of the themes in relation to the data set was reviewed and discrepancies were resolved through discussion.

3. Results

This analysis identified four main themes (Tables 1,2,3 and 4):

- the first experience with physical restraint in pediatrics,
- dental students' perception of PS,
- the theoretical and clinical training on physical restraints at the Faculty of Dental Surgery of Toulouse, France,
- the role of PS in future practice.

3.1 Theme 1: First experience with PS in pediatrics (Table 1)

At the Faculty of Dental Surgery in Toulouse (France), students start pediatric dentistry practice in the fourth year. The students in this study were confronted with PS essentially while observing or assisting a pediatric dental specialist on the unit. Some students were confronted with physical restraint with young or uncooperative children, or when a cooperative child refused the end of a treatment. The triangle of care is specific to pediatric care, and it was sometimes the parent who initiated physical restraint. Other students explained that they had never witnessed PS and they had only a vague idea of the limits. This raised questions concerning the definition of physical restraint and what it involves. In addition, dental students explained that all types of PS are not equivalent. However, the different types of PS were more or less accepted and tolerated.

3.2 Theme 2: Dental students' perception of PS (Table 2)

The use of PS is not without consequence for patients, parents and the medical team. It can have a significant psychological impact, which was described in various terms by the dental students: a feeling of "embarrassment" and "unease" following PS. Burnout, a state of emotional, physical and mental exhaustion caused by excessive and prolonged stress, was also a central concern. Students were aware of their role as caregivers and sometimes found it difficult to associate PS with patients' well-being. For example, they were afraid of causing an emotional shock in pediatric patients. A sentiment of violence, which is contrary to the principles of the Hippocratic

TABLE 1. First experience with PS in pediatrics.

Main Theme	Theme	Citations
First experience with PS in pediatrics		
	Witness	"Yes, I have mostly seen PS during pediatric dental care." Student 5. "The dad applied PS without me asking him to. I really disliked it. I found it inappropriate. So, we stopped the dental treatment" Student 11.
	Actor	"Yes, I've already had to help to restrain a disabled 13-year-old patient." Student 9. "She was trusting and had had a tooth removed already. When the time came to remove another tooth, it didn't go well. I had to physically restrain her by holding her hands" Student 5. "An instructor once asked me to hold a child with the help of the dad." Student 11. "We always use PS a little with my partner. I distract the children by holding their hands a bit so that she can work undisturbed" Student 11.
	Never administered or interpretation of what PS involves	"No, I have never seen physical restraint. I don't know whether it is included in PS, it was more to encourage the child to keep his hands on his stomach or to calm him. I did not really apply force to prevent him from fidgeting" Student 3. "Never. At most it was to hold the hands of a young child to prevent a movement from interfering with the treatment." Student 10. "I get the impression that there are several grades in physical restraint" Student 5. "If there had been a need for physical restraint, I don't think I could have done it." Student 9.

PS: protective stabilization.

TABLE 2. Dental students' perception of PS.

Main Theme	Theme	Citations
Dental students' perception of PS		
	Consequences for the students	"At first, I felt uncomfortable, and I thought to myself 'I'm not going to be able to do this'." Student 5. "For me, it was quite violent: the girl was already upset, she was afraid of the dental treatment, we had 6 people holding her." Student 2. "I identified with her a little bit: I could feel what the patient was feeling. He must have felt oppressed, it made me sad." Student 4. "I'm afraid that kind of stress will lead to burnout. I realized that we are all in the same boat and, in a way, that is reassuring. It's the nature of the job. It's not my fault, I'm not a bad person" Student 5. "Working conditions will never be ideal. I am almost sure it will affect my stress level and my way of treating patients under good conditions" Student 3.
	Consequences for the child	"I find it a bit disturbing for the children, and aggressive. I'm afraid that after that, the child will not want to go for medical care." Student 10. "I also think about the patient's future care which could also be complicated by the trauma from this physical restraint. I think it is better to delay and reprogram, if possible." Student 3. "I think it could be experienced as an assault" Student 6.
	Necessity of PS	"I know we have to do it, but I can't ignore the fact that he's screaming, that we are forcing him and that it might have a negative impact on him. Decision-making is okay, it's putting it into practice that's complicated." Student 4. "The dental treatment wasn't possible otherwise, but I felt compelled to ask questions at the end about the need for restraint." Student 1.

PS: protective stabilization.

Oath, was also reported. In addition, the quality of oral care can be impacted when it is administered with PS. Nevertheless, dental students are aware of the need for physical restraint in special cases. Although it is not a natural procedure, they understand the therapeutic choice of the instructor and trust the educational team.

3.3 Theme 3: The theoretical and clinical training related to PS (Table 3)

During the various interviews, it was often reported that there was a lack of information on PS and theoretical training seemed insufficient. This lack of information was explained by the complexity of providing such training on physical restraint because there are elements of subjectivity in the management of this practice. The indications for PS should be defined because decision-making is difficult, potentially stressful and non-intuitive for students. PS techniques should also be taught so that students can be more comfortable with its application and subsequently be more effective. In addition, better knowledge of the techniques would prevent child endangerment. Students would also like to master the technique and thereby decrease the negative psychological impact of restraint on patients.

The teaching method most often used is lectures as well as presentations in small groups. For example, the instructors address the subject with the students during clinical rotation. But more formal meetings could be considered. Students seemed to have a need to discuss the subject, and this could clarify misinterpretations. Addressing the subject of PS would allow students to feel that they are not alone in having an emotional reaction during the use of physical restraint. Role playing might be a more suitable method to teach PS. The pediatric rotation is also an excellent opportunity to teach the use of physical restraint. Other students do not think it would be helpful. Finally, dentists could improve their knowledge through continuing education after initial training.

3.4 Theme 4: PS in dental students' future practice (Table 4)

We asked the students about the importance of PS in their future practice. First, opposers were unwilling to integrate physical restraint in their practice for fear of a negative impact on the trust inherent in the care relationship between the different parties involved. For some students, PS does not conflict with this relationship of trust, as long as the well-being of the patient remains the focal concern. In the majority of cases, students had not yet formed an opinion and seemed inclined to think that the use of PS should be examined on a case-by-case basis. Some students preferred to wait until they gain experience and to refer to a specialist in the meantime.

4. Discussion

Previous studies on the perception of dental students concerning behavior guidance techniques in pediatric dentistry have included students in different years of study [15, 18]. The authors sometimes evaluated the changes in dental students' perception throughout the dental curriculum [19]. These studies indicate a preference for the less restrictive behavior guidance techniques in pediatric dentistry such as positive reinforcement, tell-show-do, voice control and distraction. This is the first time that fifth- and sixth-year dental students' perception of an advanced behavior guidance technique, PS, has been evaluated. During the interviews, the dental students were unanimous about the "unease" generated by the use of PS during pediatric dental care. This technique was experienced as "violent", "disturbing", "anxiety-provoking" and "shocking". The perception of physical restraint could be influenced by the relationship between the student and his environment, background, culture and level of experience in dental care. These negative feelings are a complex social phenomenon that is difficult to quantify but which seems to coincide with the idea that PS is a negative experience for children and parents and could have a negative psychological impact.

Cognitive-behavioral techniques have become a standard of care and are included in dental curricula [19]. In addition to the controversial nature of the technique, the risks associated with its use, and the decrease in acceptability among parents and patients, dental students do not perceive PS as a highly acceptable intervention. However, some students are also aware of the benefit of physical restraint for "the good of the patient" when other treatment options are unsuccessful (premedication, distraction, *etc.*) or unavailable, such as quick access to treatment with general anesthesia. This study is consistent with our previous study on dentists' perception of PS [12] in which dentists experienced internal conflict concerning the necessity to use restraint as opposed to the respect of individual dignity. This dilemma has also been noted in other studies [13, 14]. In this context, recommendations for practice were recently proposed to improve pain outcomes and protect the psychological health of children during potentially painful procedures, especially those involving the use of protective stabilization [20].

Our study showed that the content of the educational course and management during clinical education could have an impact on dental students' perceptions of PS and on their current and future practice. The AAPD recommends focusing on pediatric dental behavior guidance techniques during the entire spectrum of dental education. In this study, the students emphasized the necessity for clinical education on PS and suggested that meetings should be organized with clinical cases and role playing. There should be more of this type of innovative and creative teaching in pediatric dentistry. In addition, one study reported that there was a link between the type of training received and the level of comfort and frequency of use of the techniques by dentists [21]. These findings suggest that learning strategies and training should be improved, especially in situations where children are uncooperative. In this study, the dental students evoked the importance of continuing education. Interventions related to the dental care of uncooperative children, and in particular the use of PS, should be discussed more regularly in national and international dental congresses.

There is no consensus on the use of physical restraint in pediatric dentistry and national and international guidelines on the use of PS for pediatric dental patients are scarce [4, 5]. Dental educators and practitioners need support for decision-making

TABLE 3. Theoretical and clinical training in PS.

Main Theme	Theme	Citations
Theoretical and clinical training in PS		
	Lack of education or training	"The only time I ever heard of this I think it was in a pediatric clinical meeting with the instructors." Student 4. "We don't really have any training." Student 11. "We could be taught the procedures. For example, I was ineffective at first with Dr. M. I didn't know where and how to position myself" Student 11. "The best way to learn about it is to see it. I've only seen one case, that's not enough" Student 2.
	Theoretical training	"We listen to what the instructors say but when we experience it, it's different" Student 4. "The most important thing is to address the technical side: how to hold the patient so that he doesn't feel threatened because I find that it can be experienced as an aggression." Student 6. "How do you apply physical restraint without upsetting the child? And what are the limits? When do you stop?" Student 11. "We don't know the techniques and we could hurt the child with physical restraint." Student 9. "I think talking about it would demystify it a bit" Student 11. "I thought the discussion about PS was really great because it allowed us to take a step back and say to ourselves 'I'm not the only one to be uncomfortable, it's not I who am weird" Student 5. "We have already discussed this with Dr. M. He explained when and how we can use PS. We talked about it in a small group. This was the only time I ever talked about PS" Student 8.
	Clinical cases (group of discussion)	"A meeting with a presentation of clinical cases would be a good idea" Student 6. "A clinical meeting would be a good idea with short clinical cases." Student 8. "I think the meeting was really very good because it allowed us to take a step back with regards to the use of PS." Student 5. "I would like a presentation of hypothetical scenarios such as: we have this pediatric patient, in such a situation, what do we do?" Student 9. "PS could be included in private training or conferences during congresses" Student 10.
	No training required	"I don't feel the need to see it before managing it if I have to in practice. I still think I have a fairly accurate idea of what it might be" Student 3. I don't think we should integrate this training into a theoretical course." Student 6.

PS: protective stabilization.

TABLE 4. PS in dental students' future practice.

Main Theme	Theme	Citations
PS in dental students' future practice		
	Opposition	"No, I don't feel like doing it." Student 1. "In any case, I will avoid dealing with this kind of situation" Student 3.
	Maybe in the future	"I think I would be willing to implement PS but with more experience, not now." Student 2. "I prefer to gain more experience and be sure of my approach with children before relying on this type of procedure" Student 2.
	Case-by-case approach	"Yes, but in very limited cases." Student 1. "If I am sure of my technique, if I could be sure of completing dental treatment with PS … maybe … I am not sure." Student 9. "I would use PS if I thought it would be positive for the child" Student 10. "I'll try premedication first but if that fails, I don't know… I think I might have to use PS, but I wouldn't be comfortable" Student 4. "PS should only be occasional." Student 11.

PS: protective stabilization.

through new guidelines so that a more specific framework can be provided for PS use [12]. An improvement in didactic and clinical training based on appropriate guidelines would make it possible to reduce the mental burden that adds to the technical difficulty of care in pediatric dentistry.

The limitations of this qualitative analysis are the classic limitations of this type of research which increases our understanding of human behavior through the words of individuals. They are primarily related to the researcher's subjectivity in conducting the interviews and analyzing and interpreting the results. The constitution of the researcher trinomial, which consists of practitioners with different sensitivities, resulted in the avoidance of a militant type of research and enabled a factual interpretation of the results. In addition, this study was based on a sample obtained from fifth- and sixth-year dental students at a single site (the University Hospital of Toulouse, France). Perceptions are dynamic and current perceptions may change over the course of the six years of the dental curriculum (and after the first experience in a private dental office). We are aware that results obtained from students in another year of study or another university might be different, and this highlights the need for future studies on this subject.

5. Conclusions

• The students were asked what PS involves and about their perception of its use in pediatric dentistry. They mentioned their first experience of PS in pediatric dentistry, which seems to have had a particular impact on them.

• They described negative feelings related to the use of physical restraint.

• Students' perception of this technique provides an indication of the need to improve didactic and clinical educational courses.

• Students should feel better prepared for future practice in terms of behavior guidance techniques and the psychological impact of PS on children.

Our high level of interest in the subject of physical restraint is due to various factors such as the changing needs and expectations of pediatric care by today's parents, the increased emphasis on children's rights, more permissiveness at home which could result in uncooperative attitudes and behavior issues in children, and major difficulties accessing care with sedation or general anesthesia, with delays of several months in certain regions and countries. This new paradigm in pediatric care would justify the effort that dental schools should make to improve didactic and clinical education in pediatric dental behavior guidance techniques.

AVAILABILITY OF DATA AND MATERIALS

The datasets generated during the current study are available from the corresponding author on reasonable request.

AUTHOR CONTRIBUTIONS

MM and MCV—designed the research study; wrote the manuscript. MM, MC and MCV—performed the research. MC and MM—analyzed the data. All authors read and approved the final manuscript.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

All study participants' parents/guardians gave their informed consent, and each interviewee could consult the data. This study was approved by the University Hospital of Toulouse, France and the department head of the Faculty of Dental Surgery of Toulouse under the number TOU-2020-TOU3-3031. It adheres to the principles of the Declaration of Helsinki and complies with international ethical standards.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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