

Clinical Section

THE EFFECTS OF METHOD OF BEHAVIOUR MANAGEMENT, CLIENT CHARACTERISTICS, AND OUTCOME ON PUBLIC PERCEPTIONS OF INTERVENTION ACCEPTABILITY IN PAEDIATRIC DENTISTRY

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Abstract. The acceptability of behaviour management methods has become an important area of concern. However, most research has focused on behaviour support plans. This study evaluated the acceptability of a restrictive procedure used in dentistry: the hand over mouth technique. Two-hundred-and-eighteen members of the general public rated one of eight vignettes using the Treatment Evaluation Inventory. A 3-factor independent groups design evaluated the effects of child disability (average intelligence or moderate learning disability), intervention method (relaxation training and reinforcement or hand over mouth) and behavioural outcome (child became less distressed or child remained distressed). A significant main effect of treatment outcome was found, and effective treatments were rated as more acceptable than ineffective treatments. There was a marginal effect of treatment type, hand over mouth being rated as less acceptable than the use of reinforcement and relaxation. Where child behaviour problems are marked, the public's ratings of acceptability are largely influenced by the outcome of treatment.

Keywords: Treatment acceptability, social validation, hand over mouth, behavioural management, dentistry.

Introduction

Behaviour problems among children during dental procedures are relatively common. For example, Holst, Hallonstein, Schroder, Ek and Edlund (1993) reported that in a sample of

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273 3-year-old children undergoing their first dental visit, 76% of children acted cooperatively, 13% of children acted reluctantly, and 11% reacted negatively. Dentists use a wide range of non-restrictive and restrictive methods to manage such behaviour problems. These include controlling termination over treatment, furnishing play materials in the waiting area, using tell-show-do, use of relaxation, a prop or dental dam during care, allowing parents into the treatment room, and holding a toy or other object during treatment (Wright, Giebartowski, & McMurray, 1991). Pharmacological approaches to the management of behaviour problems have included use of nitrous oxide and general anaesthesia (Acs, Buke, & Musson, 1990). Restraint methods including hand over mouth and hand over mouth with airway restriction have also been adopted (Acs *et al.*, 1990; Carr, Wilson, Nimar, & Thornton, 1999). Hartmann, Pruhs and Taft (1985) reported that in single-practice dental surgeries hand over mouth was used with almost 10% of patients and in less than 2% of dental visits. It was used primarily for 3-year-old patients, although on a single occasion, the technique was also used with older children.

The use of restrictive methods of behaviour management intervention methods has raised considerable concern, especially in the light of the potential effectiveness of alternative less restrictive and more acceptable methods of behaviour management during dental procedures (Allen & Stokes, 1987). Several authors have voiced concern over the use of such procedures, including liability and legal issues (Bowers, 1982). Subsequently, the use of hand over mouth and hand over mouth with airway restriction has reduced in dental practice (Carr *et al.*, 1999) and in professional training (Acs *et al.*, 1990; Acs, Hersch, Teston, & Wai Nh, 2001; Tilliss, 1993). This reduction in the use of hand over mouth techniques may reflect the gradual uptake of more positive methods of behaviour management (Allen, Stanley, & McPherson, 1990) and concern over legal issues on the part of practitioners (Carr *et al.*, 1999). However, there is some evidence that the uptake of positive methods has been slow in some regions (Wright *et al.*, 1991) and that both hand over mouth and hand over mouth with airway restriction continue to be used by some practitioners for reasons apparently unrelated to patient factors (Acs *et al.*, 2001; Nathan, 1989). For these reasons the use of hand over mouth continues to raise concern.

Although there has been considerable debate in the professional literature concerning the use and acceptability of restrictive and non-restrictive methods of behaviour management during dentistry, there has been surprisingly little empirical evaluation of this question. Havelka, McTigue, Wilson and Odom (1992) evaluated the effect of providing parents with explanations of the use of various forms of behaviour management during dental care. When parents were given explanations of intervention methods they were more likely to rate the methods as more acceptable. Havelka *et al.* also reported that hand over mouth, general anaesthesia and restraint using a Papoose board were the least acceptable approaches to behaviour management as rated by parents. They also noted large individual differences in parental response and effects of social class on ratings of acceptability. Similar results were reported by Scott and Garcia-Godoy (1998) who found that Hispanic parents found hand over mouth and Papoose board restraint generally unacceptable. In this study, parents tended to prefer general anaesthesia rather than hand over mouth. Brandes, Wilson, Preisch and Casamassimos (1995) reported data on the acceptability of various restrictive and non-restrictive behaviour management procedures on parents of typical children and parents of children with disabilities. They reported few differences between groups of parents, but again found that informing parents enhanced intervention acceptability.

Murphy, Fields and Machen (1984) assessed the attitudes of parents towards 10 different behaviour management techniques employed in paediatric dentistry. Parents viewed videotaped segments of treatment using 10 different treatment approaches to disruptive behaviour: general anaesthesia, Papoose board, sedation, hand over mouth, physical restraint by the dentist, physical restraint by the assistant, mouth prop, voice control, positive reinforcement, and tell-show-do. Parents ranked the acceptability of the techniques relative to each other. Parents found tell-show-do, positive reinforcement, voice control and mouth props most acceptable. Physical restraint by either dentist or assistant was viewed significantly more favourably than sedation and hand over mouth. The least acceptable techniques were general anaesthesia and the use of a Papoose board. Parental socioeconomic status was negatively correlated with approval of general anaesthesia. Using the same methodology but additionally providing information on the nature of the dental treatment to be performed, Fields et al. (1984) found that the acceptability of the behaviour management technique was related to the nature of the treatment performed. Pharmacological treatments (general anaesthesia and sedation) were judged acceptable by a majority of patients only for extractions and restorations. Physical restraint by the assistant was viewed as acceptable for a wider range of treatments than restraint by the dentist, which was viewed as acceptable only for giving an injection. Voice control, mouth props, positive reinforcement, and tell-show-do are acceptable for nearly all procedures. The Papoose board and hand over mouth were unacceptable to the majority of parents for all dental procedures.

These studies clearly identify the impact of behaviour management technique and type of treatment on perceived acceptability of treatments. However, these conclusions are limited by several considerations. First, they all used non-standardized measures of treatment acceptability such as visual analogue scales or ad hoc rating scales. Second, no study examined the impact of the outcome of the child behaviour management method. Research into the acceptability of behaviour management methods in individuals with learning disabilities (Morgan, 1989; McDonnell, Dearden, & Sturme, 1993; McDonnell & Sturme, 2000) and eating disorders (Newton, Hartley, & Sturme, 1993) has indicated that the effectiveness of behaviour management intervention is an important determinant of acceptability. Finally, these studies all used parents as raters. No study to date has collected data on the acceptability of behaviour management methods from members of the general public. The acceptability and humanity of treatments is an important concern for all those involved in the delivery of clinical services. Ascertaining the views of the general public will allow those involved in planning services to design services that are acceptable to all potential service users. Therefore, in this study we evaluated the impact of restrictiveness of behaviour management method, effectiveness of child outcome, and child characteristics on the acceptability of behaviour management methods during dental treatment using a standardized measure of treatment acceptability.

Method

Participants

The sample comprised 218 members of the general public who agreed to participate in the study. There were 103 males (47%) and 115 females (53%). The ages of the sample were distributed as follows: 16 to 24 years, 46 individuals (21%); 25 to 34 years 62 individuals

(28%); 35 to 44 years, 39 individuals (18%); 45 to 54 years, 32 individuals (15%); 55 to 64 years 23 individuals (11%); and 65 years and over, 16 individuals (7%). All participants were approached by two researchers in a variety of settings, including shopping centres, general medical practices and hospital outpatient clinics. Participants were asked to consent to participate in a study examining their perceptions of the acceptability of techniques of behaviour management for children attending the dentist.

Procedure

Participants were randomly assigned to one of eight cells in a 3-factor independent groups design. The three factors were child characteristics (a child with average intelligence vs. a child with moderate learning disability), method of intervention (use of reinforcement and relaxation training vs. hand over mouth), and outcome in terms of the effect of the intervention on the child's disruptive behaviour (positive vs. negative). Reinforcement and relaxation training, and hand over mouth were selected as alternative interventions as they are both recommended for use with children and with similar levels of dental anxiety (McDonald & Avery, 2000).

Eight case scenarios were drawn up describing a young man aged 13 years who was fearful of attending the dentist. All scenarios were standardized for age of child, level of fear, and the presence of accompanying person (the child's mother). Information about the child's level of intelligence was manipulated with two levels. In the average intelligence condition the scenario read:

Mike is a 13-year-old boy. Mike is quite an average 13-year-old. He has no problems at school. He does as well in his academic subjects such as reading, writing and maths as an average 13-year-old. Mike is fit and healthy, has had the usual health problems of growing children but is well now.

In the learning disability condition the scenario read:

Mike is a 13-year-old boy. Mike has had some problems at school and a psychological evaluation indicated that he has a moderate learning difficulty. His IQ is 56 (the average is 100). The psychologist also found that Mike has quite marked problems with academic subjects such as reading, writing and maths. On these kinds of intellectual tasks Mike can perform as well as an average 4-year-old. Mike also has epilepsy but this is well controlled by tablets; he also has mild cerebral palsy.

In all conditions information was then given about the level of fear:

Mike has been anxious about going to the dentist for about 2 years now. Sometimes it takes a great deal of persuasion for him to go. There have been times when he has been so scared that he has started to cry. Sometimes he has tried to push the dentist away from him during examination and treatment procedures. Yesterday he went for a routine dental examination. Prior to arriving at the dentist he was very scared and apprehensive. He told his mother he hated going to the dentist and did not want to go because he felt sick.

When Mike sat in the dental chair he would not look at the dentist. As the dentist gently tried to proceed with the examination Mike struggled and began to thrash around in the chair.

Information was then given about the intervention. The relaxation and rewards intervention was described as:

The dentist told Mike that he should be brave. The dentist told Mike to breathe slowly. The dentist showed Mike how to breathe slowly. She told Mike to watch her carefully and to copy how she breathed. She told Mike that if he completed the dental examination without struggling she would give him a sticker.

The description of the hand over mouth technique was modified from a standard dental text (McDonald & Avery, 2000):

The dentist told Mike that he should be brave. He held Mike firmly in the chair. The dentist put one hand over Mike's mouth and said, "Stop". The dentist held Mike in the chair with his hand over his mouth like this until Mike calmed down.

One of two conditions of outcome was then described. Either a negative outcome:

Mike did not calm down even after 30 seconds. He was clearly scared and was unable to co-operate through most of the procedure. He cried and struggled. When the examination was complete, he cried as he walked out of the dentist's surgery.

Or a positive outcome:

Mike calmed down after about 30 seconds. He was clearly scared, but was able to co-operate through most of the procedure. He did not cry or struggle any more. When the examination was complete he walked out of the dentist's surgery, smiled and was pleased that he had completed the examination.

Eight vignettes were compiled which corresponded to all eight factorial combinations of the three factors. (Copies of the materials are available from JTN). The participants were first asked to read their vignette. The participant then completed a modified version of the Treatment Evaluation Inventory Parent Evaluation (TEI) form (Kazdin, 1984; Kazdin, French, & Sherick, 1981). This version of the TEI was modified to assess the viewpoint of the rater rather than the parent. The TEI is a 19-item questionnaire that can be scored as a total score, or as two sub-scales – Parental Progress, which indicates the extent to which parents feel that the treatment has benefited the child, and Acceptability, which measures the perceived acceptability of the treatment. In our study, the dependent variable was the total score on the TEI. We used the total score as factor analyses of this and another data set indicated a single factor structure to the instrument. Each item has a 5-point response format that varies in wording according to the question. For all questions responses are scored 1 to 5, with higher scores indicating greater acceptability. Total scores therefore range from a minimum of 19 (low acceptability) to a maximum of 95 (highly acceptable intervention).

The reading of the vignette and the completion of the questionnaire took participants from 3 to 10 minutes.

Statistical analyses

Data were analysed using ANOVA models calculated using the General Linear Modelling component of SPSS (SPSS Inc). The significance of the 3-way interaction was analysed first and, if significant, interpreted, followed by the lower level interactions and, finally, main effects were analysed.

Table 1. Mean values of Treatment Evaluation Inventory for the eight scenarios

Scenario	Child disability	Intervention method	Outcome	Total TEI Mean (SD)
A	Average intelligence	Relaxation & rewards	Good	56.4 (10.3)
B	Average intelligence	Relaxation & rewards	Poor	30.4 (7.5)
C	Moderate mental retardation	Relaxation & rewards	Good	60.6 (12.3)
D	Moderate mental retardation	Relaxation & rewards	Poor	32.9 (11.0)
E	Moderate mental retardation	Hand over mouth	Good	54.5 (11.0)
F	Moderate mental retardation	Hand over mouth	Poor	28.5 (11.0)
G	Average intelligence	Hand over mouth	Good	58.5 (16.7)
H	Average intelligence	Hand over mouth	Poor	26.6 (8.3)

Results

Table 1 shows the mean values of the total score derived from the TEI each of the 8 scenarios. There were no significant interaction terms. There was a main effect of outcome ($F[1,210] = 297.20, p < .001$). The estimated marginal means for the total score for outcome were: negative outcome mean = 29.59 (95% CI 27.4 to 31.8), positive outcome mean = 57.50 (95% CI 55.2 to 59.8). Thus, there was a large effect of treatment outcome on acceptability. There was a marginally significant mean effect of type of intervention ($F = 3.52 [1,210], p < .06$). The adjusted mean score for reinforcement and relaxation was 45.06 (95% CI 42.8 to 47.3) and for hand over mouth was 42.02 (95% CI 39.7 to 44.3). There were no other statistically significant effects.

Discussion

The perceived acceptability of two behavioural interventions used in dental settings was compared. The impact on ratings of acceptability of the outcome of the intervention in terms of change in behavioural distress, and of the characteristics of the child was also determined. Ratings made by members of the public of methods of behaviour management were influenced to a very high degree by the outcome of the intervention methods. Irrespective of child characteristics and independent of intervention method used, members of the public rated effective methods of intervention as highly acceptable. There was a marginally significant effect whereby the hand over mouth method of behaviour management during dental procedures was perceived as somewhat less acceptable than relaxation training and reinforcement; however, the effect was of modest size. This contradicts some findings that reported that such restrictive methods are markedly less acceptable than other procedures (Havelka et al., 1992; Scott & Garcia-Godoy, 1998; Brandes et al., 1995; Morgan, 1989; Murphy et al., 1984; Fields et al., 1984). Finally, we observed no effect of whether or not the child had average intelligence or had severe mental retardation. This latter finding is similar to other research in this area (Brandes et al., 1995).

Previous research on treatment acceptability in dentistry has not evaluated the impact of intervention outcome on acceptability. Thus, a simple explanation of the findings is that when treatment outcome is added into a study, the impact of treatment outcome can swamp the impact of other factors, such as treatment restrictiveness, on acceptability. Another pos-

sibility is that the presentation of the treatment in a written scenario does not have the same impact upon raters as either experiencing the treatment (Havelka et al., 1992; Scott & Garcia-Gody, 1998; Brandes et al., 1995), or viewing video recordings of the treatment being carried out (Murphy et al., 1984; Fields, Machen, & Murphy, 1984). The saliency of the stimulus being rated may be an important consideration. Finally, it is possible that under certain situations restrictive and even painful procedures are viewed as acceptable. For example, Mudford (1995) reported that in a case of severe and life threatening rumination that was unresponsive to simple positive interventions, the local Human Rights Committee refused approval for treatment using contingent electric shock. Consequently, the client was force fed using an intranasal tube. This resulted in violent struggling and obvious discomfort. Thus, in practice, a highly restrictive and very uncomfortable, if not outright painful, intervention was acceptable in that situation. It may be that the public expects a certain degree of discomfort and pain during dental treatment and this is acceptable under certain conditions. Future research could evaluate and extend this finding to determine whether other restrictive or painful behaviour management procedures during dental procedures also have only marginal impact on acceptability compared to client outcome.

This study can not be taken as an endorsement of the hand over mouth technique. The data presented here only reflect its acceptability in an analogue study in one sample. Furthermore, reliable and robust data on the safety of the hand over mouth technique are not yet available. Given the possibility of injury to the child during this procedure, other probably safer methods, such as relaxation training, reinforcement, and other positive behavioural methods should be explored. Other important outcomes when evaluating the use of behaviour management techniques include client dignity and respect; on these measures it is unlikely that hand over mouth would fare well. Future research should address the issue of client safety and injuries during the management of behavioural episodes during dental procedures.

One clear finding is that the public finds effective interventions to be acceptable. This places the onus on practitioners to evaluate their skills in behaviour management and to monitor the outcome in terms, not merely of successful completion of the dental procedure, but also in reduction of child behaviour problems. Future research could address developing simple methods of measuring this client outcome.

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