Scientific Article

Age and Gender Differences in the Use of Behavior Management Techniques by Pediatric Dentists

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Abstract: ***Purpose:*** *This study evaluated differences in the use of behavior management techniques among older and younger male and female pediatric dentists.* ***Methods:*** *We surveyed all active members of the American Academy of Pediatric Dentistry residing in the U.S. and Canada. Responses were received from 2467 (59%). The survey contained items on age, gender, and use of behavior management techniques.* ***Results:*** *Males respondents outnumbered females 2:1. Age categories were dichotomized as < 46 and ≥ 46 years. Females constituted 53% of the younger group and 14% of the older group. Four gender/age categories were used. A minority indicated that they used hand-over-mouth and active immobilization of sedated patients. No significant differences by groups were seen for use of most basic behavior management techniques. Significant differences by gender/age distribution were seen for the use of non-verbal communication and advanced techniques. Most differences in anticipated changes in technique use were age-related. Most favored parental presence in the operatory, though older males were significantly less likely to allow parental presence for some procedures.* ***Conclusions:*** *Some statistically significant differences in the use of behavior management techniques exist between older and younger male and female pediatric dentists. Overall, however, the 4 gender/age groups report similar frequencies of use of the techniques surveyed in this study. (Pediatr Dent 2007;29:403-8) Received July 17, 2006 / Revision Accepted January 4, 2007.*

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Studies of the differences in the roles of male and female dentists in the United States and other countries have focused on a variety of practice and career parameters.[1-4] Specific to US pediatric dentists, Roberts et al evaluated the career preferences of pediatric dentistry advanced education students.[5] Women were significantly more likely than men to report a preference for: (1) part-time associate status; (2) public health practice; and (3) private practice. A subsequent publication by the same authors reported additional career-influencing factors that were perceived differently by men and women.[6] Little has been published, however, regarding male/female differences among pediatric dentists regarding behavior management techniques. Peretz et al in 2003 surveyed 112 pediatric dentists in Israel about the behavioral and pharmacologic methods used in their practices to treat children.[7] They found few differences between the sexes in the use of tell-show-do and the distribution of prizes at the end of appointments. Passive (papoose board) and active (dental assistant) restraint were employed more by male pediatric dentists, as was general anesthesia. Though not statistically significant, females were more likely to report having experienced some feelings of aggression toward a patient. Overall, however, Peretz et al concluded that male and female pediatric dentists used behavior management techniques similarly.

Carr and colleagues reported in 1999 on the differences among pediatric dentists in various age groups (<30, 30-39, 40-50, and >50 years) with respect to their use of a variety of behavior management modalities.[8] No difference among age groups was found for the use of tell-show-do, but the authors found significant differences between younger and older practitioners in their use of other techniques. Specifically, older practitioners (>age 40) and those with more years in practice reported significantly greater use of: (1) parents in the operatory; (2) hand-over-mouth (HOM); (3) physical restraint; and (4) conscious sedation. Younger dentists and those with fewer years in practice were more likely to report the use of nitrous oxide/oxygen or general anesthEsia. A survey of advanced education programs in pediatric dentistry by Adair et al suggests that differences in technique usage between younger and older pediatric dentists is likely to continue.[9] No data are available on contemporary use of behavior management techniques by older vs younger male and female pediatric dentists.

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This study's purpose was to examine the use of behavior management techniques, including parental presence in the operatory, by older and younger male and female pediatric dentists.

Methods

This study was approved by the Human Assurance Committee of the Medical College of Georgia, Augusta, Ga. The data for this study were derived from a subset of responses to a survey of members of the American Academy of Pediatric Dentistry (AAPD). The development and execution of the pretested survey have been described previously.[10] Briefly, surveys were mailed to 4,180 active and affiliate AAPD members residing in the United States and Canada. Initial mailings took place in June 2003, with a follow-up mailing in August of that year. Respondents were asked about their use of 10 nonpharmacologic and 3 pharmacologic behavior management techniques with healthy, nondisabled children in their practices. Definitions of each of the nonpharmacologic techniques taken from the then-current AAPD Reference Manual were provided.[11] Practitioners were also asked about their preferences for parental presence in the operatory for 7 specific clinical procedures or situations.

This study's data were taken from the surveys of individuals who reported that they were pediatric dentists without other specialty training. Responses from general dentists and specialists other than pediatric dentists were not used. Descriptive statistics were calculated for all variables. Differences in the distribution of responses between younger and older male and female practitioners were examined by means of chi-square tests. An alpha level of 0.05 was established a priori as the level for statistical significance.

Results

Surveys were returned by 2,768 respondents, of which 2,751 were usable for the original study. Of the surveys, 93% (2,545) were completed by pediatric dentists. Of these, 2,457 reported no other specialty training, and those surveys constitute this study's sample. The adjusted survey response rate was 59%. On individual surveys, the response rate was less than 100% for every question, so the total number of responses varied by survey item.

Respondents were asked to indicate their age in 1 of 5 categories (≤35, 36-45, 46-55, 56-65, and ≥66 years). Most respondents were between the ages of 26 and 66 years. These age categories were then dichotomized: (1) ages <46 years (N=1,190); and (2) ≥46 years (N=1,267). Age data were missing from 10 surveys. Males outnumbered females 2:1 (1,615 vs 813, respectively). Designation of sex was missing from 39 surveys. Females constituted 53% of the younger age group and 14% of the older age group. The distribution of age by sex groups was significant (P<.001), with male respondents more likely to be older than females. Respondents were grouped into 4 gender/age categories: (1) males <46 years; (2) females <46 years; (3) males ≥46 years; and (4) females ≥46 years.

Table 1. NUMBER (%)* OF RESPONDENTS REPORTING USE OF BEHAVIOR MANAGEMENT TECHNIQUES WITH HEALTHY, NONDISABLED CHILDREN

Technique	Gender/age groups				
	Males <46	Females <46	Males >46	Females >46	*P*-value †
Tell-show-do	602 (99)	693 (100)	1172 (99)	210 (99)	.26
Nonverbal communication	245 (91)	608 (88)	1096 (93)	192 (91)	.003
Voice control	556 (92)	619 (89)	1123 (95)	185 (88)	<.001
Positive reinforcement	601 (99)	689 (99)	1170 (99)	209 (99)	.73
Distraction	585 (97)	680 (98)	1118 (95)	201 (95)	.002
Hand-over-mouth	117 (19)	94 (14)	304 (26)	40 (19)	<.001
Active immobilization of nonsedated child	436 (72)	526 (76)	805 (72)	154 (73)	.24
Passive immobilization of nonsedated child	412 (68)	510 (74)	763 (65)	143 (67)	.001
Active immobilization of sedated child	287 (47)	321 (46)	561 (47)	94 (44)	.84
Passive immobilization of sedated child	339 (56)	406 (59)	636 (54)	127 (60)	.13
Nitrous oxide/oxygen inhalation analgesia	536 (89)	625 (90)	977 (83)	177 (83)	<.001
Conscious sedation	414 (68)	438 (63)	687 (58)	134 (63)	<.001
General anesthesia	491 (81)	492 (71)	813 (69)	131 (62)	<.001

* Some respondents did not answer every question

† *P*-value of chi-square test.

Table 2. NUMBER (%)* OF RESPONDENTS REPORTING USE LIKELIHOOD OF CHANGES IN USE OF BEHAVIOR MANAGEMENT TECHNIQUES OVER THE NEXT 1 TO 2 YEARS †

Technique	Gender/age groups				
	Males <46	Females <46	Males ≥46	Females ≥46	*P*-value ‡
Tell-show-do					<.001
Will use less	1 (<1)	1 (<1)	5 (<1)	0 (0)	
Will use more	59 (10)	58 (8)	52 (4)	14 (7)	
Nonverbal communication					<.001
Will use less	22 (4)	13 (2)	11 (1)	2 (1)	
Will use more	49 (9)	47 (8)	50 (4)	12 (6)	
Voice control					<.001
Will use less	86 (15)	78 (12)	62 (5)	23 (12)	
Will use more	29 (5)	40 (9)	35 (3)	12 (6)	
Positive reinforcement					<.001
Will use less	3 (<1)	1 (<1)	5 (<1)	0 (0)	
Will use more	89 (15)	87 (13)	81 (7)	10 (10)	
Distraction					<.001
Will use less	6 (1)	5 (<1)	9 (<1)	2 (1)	
Tell-show-do					<.001
Will use more	86 (15)	86 (13)	66 (6)	14 (7)	
Hand-over-mouth					.13
Will use less	44 (24)	34 (21)	121 (24)	23 (31)	
Will use more	0 (0)	4 (2)	3 (<1)	1 (1)	
Active immobilization of nonsedated child					<.001
Will use less	94 (20)	110 (20)	105 (11)	24 (14)	
Will use more	24 (5)	22 (4)	39 (4)	5 (3)	
Passive immobilization of nonsedated child					<.001
Will use	72 (16)	90 (17)	102 (11)	19 (11)	
Will use more	33 (7)	31 (6)	27 (3)	9 (5)	
Active immobilization of sedated child					<.001
Will use less	54 (15)	55 (13)	60 (8)	17 (14)	
Will use more	18 (5)	21 (5)	19 (3)	1 (<1)	
Passive immobilization of sedated child					<.001
Will use less	44 (11)	43 (9)	53 (7)	10 (7)	
Will use more	32 (8)	39 (8)	27 (3)	5 (4)	
Nitrous oxide/oxygen inhalation analgesia					<.001
Will use less	21 (4)	42 (7)	34 (3)	4 (2)	
Will use more	84 (15)	111 (17)	85 (8)	20 (11)	
Conscious sedation					<.001
Will use less	90 (20)	89 (18)	120 (15)	20 (13)	
Will use more	63 (14)	89 (18)	84 (10)	25 (17)	
General anesthesia					.29
Will use less	24 (5)	24 (4)	31 (3)	5 (3)	
Will use more	168 (32)	185 (34)	257 (29)	42 (29)	

* Some respondents did not answer every question

‡ *P*-value of chi-square test.

† Not shown: No. (%) of respondents who indicated no anticipated changes

The majority of practitioners in both age groups indicated that they used each of the pharmacologic and nonpharmacologic techniques with healthy, nondisabled children, with the exception of HOM and active immobilization of a sedated patient. Table 1 illustrates the distribution of respondents who reported using a given behavior management technique. No significant differences by gender/age category were seen for the reported use of: (1) tell-show-do; (2) positive reinforcement; (3) active immobilization (restraint by an individual) of a sedated or nonsedated child; or (4) passive immobilization (use of a restraining device) of a sedated child.

Younger females were significantly less likely to indicate the use of nonverbal communication, though that technique was used by a large majority of respondents in each gender/age category. Younger females were significantly less likely than older males to employ HOM, a technique used by a minority of all respondents. Younger females were significantly more likely than males to report use of distraction, while females in both age groups were more likely than males to report use of passive immobilization of a nonsedated child. Younger practitioners were significantly more likely to use nitrous oxide and general anesthesia. Finally, older males were significantly less likely to employ sedation.

The distribution of responses to the question of anticipated changes in the use of behavior management techniques is shown in Table 2. For each technique, a majority of respondents in each gender/age group reported no anticipated changes in the frequency of use (data not shown). Only those practitioners who indicated an anticipated change are included in the analysis. Across the gender/age groups, the respondents who anticipated a change in the use of a technique indicated that they were likely to increase their use of: (1) tell-show-do; (2) nonverbal communication; (3) positive reinforcement; (4) distraction; (5) nitrous oxide; and (6) general anesthesia. Anticipated changes for all other techniques were toward less use.

Significant differences in the distribution of "will use less" and "will use more" responses were seen among gender/age groups for each technique, with the exception of HOM and general anesthesia. Most of these differences were related to age, not gender. Younger practitioners were significantly more likely to report anticipated increases in their use of: (1) tell-show-do; (2) nonverbal communication; (3) positive reinforcement; (4) distraction; and (5) nitrous oxide. Younger respondents were also more likely to report anticipated decreases in their use of: (1) voice control; (2) active immobilization of a nonsedated child; (3) passive immobilization of a nonsedated child; (4) passive immobilization of a sedated child; and (5) sedation. Older males were significantly less likely than the other gender/age groups to anticipate less future use of active immobilization of a sedated child. The percentages of practitioners indicating a likely change in the future use of any technique was relatively small, however, in any gender/age group.

Regarding parental presence in the operatory, no significant differences were seen among the gender/age groups for: (1) emergency examinations; (2) surgical procedures; or (3) sedations (Table 3). All significant distributions could be attributed to older males, who were less likely to allow parental presence: (1) for routine examinations/prophylaxis; (2) for restorative treatment; (3) to assist with immobilization; or (4) to assist in the treatment of a child with special health care needs.

Table 3. NUMBER (%)* OF RESPONDENTS INDICATING PARENTAL PRESENCE ALLOWED FOR PROCEDURE

Procedure/clinical situation	Gender/age groups				
	Males <46	Females <46	Males ≥46	Females ≥46	*P*-value †
Routine examination/prophylaxis	507 (94)	653 (100)	1076 (92)	198 (95)	.01
Emergency examination	585 (97)	663 (97)	1114 (95)	200 (96)	.14
Restorative procedure	531 (88)	610 (89)	969 (83)	182 (89)	<.001
Surgical procedure	450 (75)	499 (74)	876 (76)	162 (79)	.50
Sedation procedure	317 (55)	336 (54)	573 (55)	109 (59)	.66
Parent to assist with restraint	514 (86)	596 (88)	937 (82)	177 (88)	<.001
Parent of child with special health care needs	591 (98)	673 (98)	1120 (96)	203 (98)	.02

* Some respondents did not answer every question † *P*-value of chi-square test.

Regarding possible future changes in allowing parents into the operatory, however, older males were significantly more likely than other gender/age groups to indicate an anticipated increase in the practice (Table 4).

Discussion

In general, the current and anticipated future use of behavior management techniques reported by the 4 gender/age groups were similar. High percentages of respondents in each category reported that they used most of the 13 behavior management techniques. HOM was used by a distinct minority of respondents, and active immobilization of a sedated child was employed by slightly less than 50% in each group.

Table 4. NUMBER (%)* REPORTING CHANGES OVER THE PREVIOUS 5 YEARS IN THE PRACTICE OF INVITING/ALLOWING PARENTS INTO THE OPERATORY

Change	Gender/age groups				
	Males <46	Females <46	Males ≥46	Females ≥46	*P*-value †
Increased	225 (38)	238 (36)	475 (40)	63 (30)	<.001
Decreased	86 (14)	132 (20)	72 (6)	21 (10)	
No change	283 (48)	298 (45)	633 (54)	124 (60)	

* Some respondents did not answer every question † *P*-value of chi-square test.

Statistically significant differences, where present, reflected small differences in distributions of responses.

Differences between older and younger practitioners in their use of specific behavior management techniques may reflect temporal differences in how these techniques were presented and taught during their residency programs. Training programs have likely shifted the emphasis toward or away from techniques because of shifts in their scientific basis, social validity, or perceived safety. In addition, older practitioners have perhaps gained confidence in certain techniques with which they have more experience and proficiency. Differences between male and female practitioners in the use of behavior management techniques can possibly be attributed to differences between the sexes in: (1) temperament; (2) communication; (3) use of language; and (4) other such factors that influence how male and female dentists interact with their patients.

For example, it is generally acknowledged females have better nonverbal communication skills than males, though there is disagreement among experts.[12,13] It was interesting, therefore, that younger females in this survey were significantly less likely than the other gender/age groups to report the use of nonverbal communication, though 88% of that group reported its use. Younger males and females were more likely than older practitioners to report anticipated increases in the use of nonverbal communication in the near future.

Carr et al reported in 1999 that older practitioners were more likely to allow parents into the operatory during dental procedures.[8] We did not find this to be true of older males, who were significantly less likely to allow parental presence: (1) for routine examinations; (2) for restorative procedures; (3) to assist with immobilization; or (4) to assist special health care needs children. The reasons for these differences may have to do with inherent gender differences and the practitioner's being trained to routinely exclude parents from treatment procedures. Still, the majority of older males allowed parents to be present for the procedures surveyed. Carr et al also reported greater use of HOM among older pediatric dentists.[8]

Our findings for older males, but not for older females, agree with this, again suggesting gender and training differences.[8] Carr et al's finding of increased use of restraint by older practitioners was not confirmed by our findings,[8] nor did we find that older practitioners were more likely to employ sedation. In fact, among this study's respondents, older males were significantly less likely to use conscious sedation. Our findings agreed with Carr et al that younger practitioners are more likely to report the use of nitrous oxide and general anesthesia. We also did not confirm the findings reported by Peretz et al in 2003 that males used active and passive immobilization more frequently than did females.[7] The differences between our findings and those of previous studies may have to do with differences in: (1) the samples surveyed; (2) defining age groups; or possibly (3) training and experience between the practitioners surveyed. Certain behavior management techniques may have gained or lost popularity during the years between various studies.

Most respondents indicated that they were not likely to increase or decrease their use of any of the 8 surveyed behavior management techniques. The techniques that respondents appeared likely to use more frequently in the future were all categorized in the 2003-04 AAPD Reference Manual as "basic": (1) tell-show-do; (2) nonverbal communication; (3) positive reinforcement; (4) distraction; and (5) nitrous oxide.[11] Of the pharmacologic techniques, only nitrous oxide and general anesthesia were indicated for increased future use. These 2 techniques are arguably safer or less stressful to the practitioner than conscious sedation. The techniques likely to be used less frequently by younger practitioners in the near future were: (1) voice control; (2) active immobilization; (3) passive immobilization; and (4) conscious sedation. Each of these, with the exception of voice control, is defined as an "advanced" technique in the 2003-04 Reference Manual.[11]

In general, older practitioners appeared to indicate that they would be less likely than younger respondents to change their frequency of use of all surveyed techniques, with the exception of HOM. Perhaps older practitioners are more secure in their use of behavior management techniques and feel no need to change. On the other hand, younger practitioners are continuing to gain experience, particularly with less invasive techniques, and may be more willing to increase or decrease their use of some techniques. Older practitioners appeared more likely to decrease their use of HOM in the near future. This may reflect the facts that HOM is used more frequently by older pediatric dentists, especially males, and that HOM has been losing social validity in recent years.[14,15]

Most respondents in all gender/age groups permitted parents to be present for the 7 situations surveyed. This was

even true of sedation procedures, though the majorities for that technique did not exceed 59%. Statistically significant differences among the gender/age groups were attributed to older males, who were less likely to allow parental presence for some procedures. It was older males, however, who indicated a likely future increase in allowing parents to be present.

Conclusions drawn from this study should be tempered by the study's limitations. First, the study data are derived from a large-scale survey. The quality of survey data is dependent on the reliability of the respondents and the validity of their responses. Survey construction also influences the data's nature and quality. In this study's survey, definitions of each behavior management technique were taken from the 2003-04 AAPD Reference Manual.[11] These definitions may or may not have corresponded closely to the way respondents applied it in their practices. Also, as noted previously, females constituted over 50% of the younger practitioners, while comprising only 14% of older practitioners. This finding is not unexpected, given the influx of females into pediatric dentistry over the last 2 decades. Finally, the survey generated a 59% response rate, which led to large numbers of responses within each gender/age group. Because the sample sizes were large, a relatively small percentage difference in responses led to statistically significant differences in the distribution of responses. While statistically significant, many of the findings reflected small differences among the gender/age groups.

Conclusions

From the data reported in this study, the following conclusions may be drawn:

1. Older and younger male and female pediatric dentists reported similar frequencies of use of the behavior management techniques surveyed in this study.
2. Statistically significant differences exist, however, between older and younger male and female pediatric dentists in their current and anticipated future use of behavior management techniques. These include their willingness to allow parents to be present in the operatory during certain procedures.

References

1. Atchison KA, Bibb CA, Lefever KJ, Mito RS, Lin S, Engelhardt R. Gender differences in career and practice patterns of PGD-trained dentists. J Dent Educ 2002;1358-67.
2. Newton JT, Buck D, Bibbons DE. Workforce planning in dentistry: The impact of shorter and more varied career patterns. Comm Dental Health 2001;18:236-41.
3. Peretz B, Ram D, Gleicher H, Mamber E. Professional education and practice arrangements: Are there gender differences among pediatric dentists in Israel? Int Dent J 2000;50:390-4.
4. Brown LJ, Lazar V. Trends in the dental health work force. J Am Dent Assoc 1999;130:1743-9.
5. Roberts MW, Seale NS, Lieff S. Career preferences of pediatric dentistry advanced education students. Pediatr Dent 1997;19:104-8.
6. Roberts, MW, Lieff S, Seale NS. Factors that affect career choices of pediatric dentistry advanced education students. Pediatr Dent 1997;19:317-20.
7. Peretz B, Glaicher H, Ram D. Child-management techniques: Are there differences in the way female and male pediatric dentists in Israel practice? Braz Dent J 2003;14:82-6.
8. Carr KR, Wilson S, Nimer S, Thornton JB Jr. Behavior management techniques among pediatric dentists practicing in the southeastern United States. Pediatr Dent 1999;21:347-53.
9. Adair SM, Rockman RA, Schafer TE, Waller JL. Survey of behavior management teaching in pediatric dentistry advanced education programs. Pediatr Dent 2004;26:151-8.
10. Adair SM, Waller JL, Schafer TE, Rockman RA. A survey of members of the American Academy of Pediatric Dentistry on their use of behavior management techniques. Pediatr Dent 2004;26:159-66.
11. American Academy of Pediatric Dentistry. Clinical guideline on behavior management. Reference Manual 2003-04. Pediatr Dent 2003:25:69-74.
12. Burgoon JK, Buller DB, Woodall WG. Nonverbal Communication: The Unspoken Dialogue. 2nd ed. New York, NY: McGraw-Hill Companies, Inc; 1987.
13. Ivy DK, Backlund P Exploring Genderspeak. New York, NY: McGraw-Hill Companies, Inc; 1994.
14. Lawrence SM, McTigue DJ, Wilson S, Odom JG, Waggoner WF, Fields HW Jr. Parental attitudes toward behavior management techniques used in pediatric dentistry. Pediatr Dent 1991;13:151-5.
15. Eaton JJ, McTigue DF, Fields HW Jr, Beck M. Attitudes of contemporary parents toward behavior management techniques used in pediatric dentistry. Pediatr Dent 2005;27:107-13.