Dental Research Journal

Original Article

The relationship between temperament and behavior in 3–7-year-old children during dental treatment

Atousa Janeshin[1], Mohammmad Habibi[2]

[1]Dental Sciences Research Center, Department of Pediatric Dentistry, School of Dentistry, Guilan University of Medical Sciences, Rasht, Iran, [2]Dentist, Private Practice, Rasht, Iran

ABSTRACT

Background: Various factors affect child behavior in different situations such as in a dental clinic. The purpose of this study was to investigate the relationship between temperament and child behavior during routine dental treatment.

Materials and Methods: The present study is a descriptive-analytic study that included 199 children aged 3–7-years from patients referred to a dental clinic of Guilan University of Medical Sciences in 2017–2018. The Children's Behavior Questionnaire, which is specific to children aged 3–7 years, was used to assess children's dental temperament. Children's behaviors during dental treatment were recorded using Frankl scale. Finally, the data were analyzed by the SPSS-16 statistical software.

Results: About 47.9% of the samples were female, with a mean temperament score of 4.79 which was significantly higher than males ($P < 0.05$). Almost 2.4% of children had completely negative behaviors and 2.8% had a completely positive behavior. The mean scores of fear ($P = 0.008$) and anger ($P = 0.004$) in children with completely negative behavior were higher than those with completely positive behavior. Moreover, the average scores of inhibitory control ($P = 0.003$) and perceptual sensitivity ($P = 0.001$) in completely positive children were higher than completely negative children.

Conclusion: The results of the present study showed that girls had a better mean score of temperament than boys. The inhibitory control and perceptual sensitivity in completely positive children were significantly higher than negative children. In addition, a higher mean score of fear and anger was observed in completely negative children.

Key Words: Child behavior, dental anxiety, temperament

Received: 20-May-2019
Revised: 26-Jan-2020
Accepted: 19-Sep-2020
Published: 17-Mar-2021

Address for correspondence:
Dr. Atousa Janeshin,
Dental Sciences Research Center, Department of Pediatric Dentistry, School of Dentistry, Guilan University of Medical Sciences, Rasht Iran.
E-mail: atousa_343@yahoo.com

INTRODUCTION

Dental fear may be experienced by patients referring to dentistry, especially in children. Children's stress control during dental treatment is one of the most important factors in the success of treatment. In pediatric dentistry, the approach to dealing with a child referring to the dentistry is a major concern, which is based on the prediction of their behavior and reactions to diagnostic and therapeutic measures.[1] Various factors affect the behavior of children in different situations such as in a dental clinic. Some of these factors

Access this article online

Website: www.drj.ir
www.drjjournal.net
www.ncbi.nlm.nih.gov/pmc/journals/1480

How to cite this article: Janeshin A, Habibi M. The relationship between temperament and behavior in 3–7-year-old children during dental treatment. Dent Res J 2021;18:12.

include psychological and behavioral characteristics, personality structure, socioeconomic status, education level, and parental ideology.[2] Based on Thomas and Chess study and the pediatric psychiatric literature, it has been revealed that a child, in terms of temperament traits, can be classified into difficult temperament, easy temperament, and a mixture of both the temperaments (slow-to-warm-up temperament).[3] According to Kaplan and Sadock study, 10% of children are difficult and 40% of them are easy.[4] Easy children show the best behavior and cooperation with parents and caregivers. One of the factors influencing a child's behavior is the temperament of children. Most experts believe that temperament depends on child mood and behavior that originate from child biology and may be attributed to the nervous system.[3] It is difficult to tolerate difficult children and interact with them for all, even their parents.[4] The most important behaviors of a difficult child include sleep–wake rhythm disorders, irregular eating and bowel habits, crying a lot without a certain reason or with a reason, unpredictable behavior, difficulty in soothing, and controlling the baby after starting crying.[5] In contrast, easy children are in the natural range of vital signs and growth criteria,[4] have a regular and predictable pattern of eating and bowel habits and high tolerance threshold, do not cry without an evident reason, and are easy to soothe and control after start crying.[6] Due to the importance of familiarity with children's behaviors and their control ways in specialist dental clinics, a large number of research studies in the field of pediatric dentistry have been dedicated to this topic.[7-9] According to Brill study, familiarity with behavioral characteristics of children and ability to predict the behavior of children in different situations have an important role in the pediatric dentist success rate, especially in the first dental visit.[10] In the first dental visit of a child, there is a fear of facing unknown dentistry instruments. Moreover, they may face different levels of pain or discomfort depending on their dental treatment needs.[11,12] In general, in order to provide an acceptable dental treatment with high quality, it is necessary to develop a proper approach to dealing with a child referring to a dentist office. In this case, the ability to manage children's behavior has been introduced as a major issue in pediatric dentistry.[13] When a dentist is unable to manage children's behavior through appropriate communication and nonphysical and medical procedures, any other diagnostic and therapeutic action may not lead to success and satisfaction of the therapist and children's parents.[14,15]

In this regard, familiarity with the behavioral characteristics of children before starting treatment procedure, choosing confrontation method, and control of children for therapists is a crucial factor, especially in dentistry. According to the above mentioned and lack of sufficient research on this issue, especially in Iran, and the differences in mood among different nationalities, this study aimed to investigate the relationship between children's temperament and children's behavior during routine dental treatment.

MATERIALS AND METHODS

In this descriptive-analytic study, samples were selected among patients who referred to the dental clinic of Guilan University of Medical Sciences during 2017–2018.

Three–seven-year-old patients whom this was their first dental visit and had decayed molars with pulp involvement were incorporated in this study. Their parents were asked for informed consent. Patients who had mental disorders and their parents did not fully answer the survey questions were excluded from the study.

In order to evaluate children's characteristics, the Children's Behavior Questionnaire (CBQ), which is specific to children aged 3–7 years, was completed by the parents or guardians. This questionnaire (CBQ) evaluates children's reaction in different situations and measures their mood.[16] In Iran, this questionnaire was translated by a psychiatrist, and its validity and reliability have been evaluated in numerous studies. For the Persian translation of this questionnaire, Cronbach's alpha coefficient and reliability coefficient have been reported as $\alpha = 0.80$ and $r = 0.83$, respectively.[17,18]

The CBQ includes 94 questions. For each question, parents or guardians assigned a score (1–7) or selected the term "not applicable." The mean score of temperament for each child was obtained from the total score of the questions answered, divided by the number of the questions.

The items selected by the parents varied from "extremely untrue of your child" to "extremely true of your child," which were assigned a score between 1 and 7, respectively. If parents selected the item "not applicable," it would not get a score. Accordingly, the questions 3, 16, 18, 19, 21, 25, 34, 35, 36, 43, 48, 49, 50, 53, 54, 56, 60, 61, 68, 74, 75, 78, 80, 82, 83, 84, 90, 91, and 92 were scored inversely.

Subsequently, children's behavior was evaluated by a pediatric dentist during the first dental treatment. All patients underwent dental pulp treatment requiring local anesthesia and their behavior scored during the treatment according to Frankl's Behavior Rating Scale:

- Rating 1: Definitely negative. Refusal of treatment, forceful crying, fearfulness, or any other overt evidence of extreme negativism
- Rating 2: Negative. Reluctance to accept treatment, uncooperativeness, some evidence of negative attitude but not pronounced (sullen, withdrawn)
- Rating 3: Positive. Acceptance of treatment; cautious behavior at times; willingness to comply with the dentist, at times with reservation, but a patient follows the dentist's directions cooperatively
- Rating 4: Definitely positive. Good rapport with the dentist, interest in the dental procedures, laughter and enjoyment.[19]

Accordingly, the relationship between the score obtained from the CBQ was evaluated through the behavior recorded by the dentist. It should be noted that the CBQ has 15 subscales of behavioral features including activity level, anger, discomfort, inhibitory control, sadness, attentional focusing, smiling, positive anticipation, impulsivity, perceptual sensitivity, shyness, fear, pleasure with high and low intensity, and falling reactivity. In order to obtain the score of temperament, the mean score of each of the domains was obtained from the total score, divided by the number of questions in each field.[16]

Finally, Pearson's correlation coefficient was used for statistical analysis of the results provided that the assumptions were made. Otherwise, Spearman's correlation test was used. All tests were performed through SPSS version 24 (Chicago, USA).

RESULTS

In this study, a total of 215 patients were studied. Accordingly, 112 boys (47.9%) and 103 girls (52.1%) participated in the study. Regarding their age, 1.9%, 35%, and 63.1% of patients were 3 years old, 4–5 years old, and 6–7 years old, respectively. The average age of participants in the study was 72.39 ± 0.74 months. The results indicated that the mean temperament score of girls in this study was more than that of the boys, and this difference was significant (P = 0.041, independent t-test) [Table 1]. Moreover, the behavior type of children showed that 68.9%, 25.9%, 2.8%, and 2.4% of them had positive behavior, negative, completely positive, and completely negative behaviors, respectively.

In Tables 2 and 3, it was shown that the type of children's behavior during dental pulp therapies had a significant relationship with the mean scores of fear, inhibitory control, positive anticipation, perceptual sensitivity, and anger. However, the type of behavior did not show a significant relationship with mean scores of variables such as shyness, activity level, discomfort, sadness, focusing, smiling, reactivity, high-intensity pleasure, low-intensity pleasure, and impulsivity.

As can be seen from Table 2, the mean score of anger in the patients who had a completely negative behavior was higher than other child temperament traits (33.20 ± 3.34), and the perceptual sensitivity in the patients who had a completely negative behavior showed a higher score (35.67 ± 0.49). Moreover, from the statistical point of view, it was more significant than other temperament traits (P = 0.001).

DISCUSSION

This study aimed to investigate the relationship between children's temperament and children's behavior during dental treatment. According to the results, 52% of the children were male. This study showed a significant difference in the score of girls' and boys' temperament. Accordingly, the girls' score was higher than that of the boys' score. This finding may be explained by the fact that boys and girls have different behavior characteristics in different cultures. Peretz also reported a significant difference between boys' and girls' behavior scores.[20] However, Tabatabaei and Brill indicated that there was no significant relationship between the mean scores of children's behavior during treatment sessions and their sex.[9,21]

Most of the children showed positive behaviors. Accordingly, 26% and 2.4% had negative and completely negative behaviors, respectively. Aminabadi *et al*. (2011) used Frankl's rating scale

Table 1: The mean score of temperament in 3-7-year-old children, based on gender

Gender	*n*	Mean±SD	Test statistics	Significance
Girl	103	4.79±0.06	2.06	0.041
Boy	112	4.58±0.08		

SD: Standard deviation

Table 2: Relationship between the scores of fear, anger, control, emotion, and perceptual sensitivity in children aged 3-7 years with the type of child behavior

Variable	Child behavior	*n*	Mean±SD	Test statistic	Significance level
Fear	Definitely negative	5	30.60±4.33	4.09	0.008
	Negative	55	23.31±1.05		
	Positive	146	240.6±0.46		
	Definitely positive	6	17.50±2.28		
Anger	Definitely negative	5	33.20±3.34	4.49	0.004
	Negative	55	25.80±1.03		
	Positive	146	26.63±0.59		
	Definitely positive	6	17.50±2.93		
Inhibitory control	Definitely negative	5	19.20±3.10	4.69	0.003
	Negative	55	26.14±1.12		
	Positive	146	28.54±0.52		
	Definitely positive	6	31±1.71		
Positive anticipation	Definitely negative	5	31.80±1.80	3.27	0.022
	Negative	55	30.78±0.94		
	Positive	146	32.38±0.40		
	Definitely positive	6	26.33±1.23		
Perceptual sensitivity	Definitely negative	5	26.80±1.65	15.72	0.001
	Negative	55	30.14±1.06		
	Positive	146	32.77±0.39		
	Definitely positive	6	35.67±0.49		

SD: Standard deviation

to study children aging 3–7 years. They showed that 29.6% and 13.8% of children had completely negative and completely positive behaviors, respectively.[16] Kleinberg *et al*. in Sweden reported a prevalence of misbehavior in children aging 3–6 years (10.5%). Their results were slightly different from those of the present study, which can be attributed to behavioral differences, geographic regions, and cultural differences. Accordingly, most children were evaluated for easy behavior. Tabatabaie *et al*. reported that children with a completely positive behavior (42%) were more likely than those who had a completely negative attitude (7%). Moreover, 10% of the children were irregular and unpredictable and 40% were regular and predic.[21]

The results showed that there was no relationship between shyness and sadness and children's behavior type. This can be because of the shy nature of children who do not express their feelings and anxiety. In this regard, Pinkham *et al*. found different results and reported that shy children were less likely to cooperate with the dentist.[3]

Studies have shown that mood types in children depend on different factors such as level of activity, anger, frustration, previous negative or positive experience, anticipation, fear, reaction, shyness, relaxation ability, great pleasure, ban, low utility, grief, embarrassment, and happiness.[22,23]

The results indicated that the mean scores of fear and anger in children with a completely negative behavior were significantly higher than other types of behavior. Aminabadi *et al*. argued that behaviors such as fear, frustration, sadness, and shyness in children with early childhood caries are associated with more noncooperative and negative behaviors.[18] Fear of dentistry was reported to be about 5%–20%.[24] Javadinejad *et al*. showed that there was a significant inverse relationship between children's dental fear and their cooperation,[25] which was in good agreement with the results of this study. Kyritisi *et al*. stated that there was a relationship between children's fear score and children's behavior and collaboration during treatment. In this study, there was no significant relationship between children's dentistry fear and gender.[26]

In the present study, control and perceptual sensitivity scores in children with a completely positive behavior were significantly higher. However, in children with completely negative behavior, the scores were significantly lower than others. A child with a high level of control follows the instructions well and shows great patience in doing things. In fact, these indicators can be used to predict children's behavior

Table 3: Relationship between the temperament variables in children aged 3-7 years and the type of child behavior

Variable	Child behavior	*n*	Mean±SD	Test statistic	Significance level
Shyness	Definitely negative	5	26.40±1.08	1.74	0.224
	Negative	55	25.71±1.08		
	Positive	146	26.07±0.55		
	Definitely positive	6	20±3.15		
Activity level	Definitely negative	5	34.60±1.40	1.56	0.200
	Negative	55	31.51±1.17		
	Positive	146	32.86±0.50		
	Definitely positive	6	28±2.77		
Discomfort	Definitely negative	5	29.20±3.84	6.17	0.103
	Negative	55	26.07±0.89		
	Positive	146	25.73±0.42		
	Definitely positive	6	16.83±13.42		
Sadness	Definitely negative	5	33.80±2.85	3.58	0.310
	Negative	55	32.20±1.15		
	Positive	146	33.11±0.54		
	Definitely positive	6	24±4.50		
Focusing	Definitely negative	5	20±4.65	2.49	0.062
	Negative	55	24.22±0.89		
	Positive	146	25.38±0.48		
	Definitely positive	6	29.17±2.33		
Smiling	Definitely negative	5	25.80±3.61	0.58	0.627
	Negative	55	27.71±1.01		
	Positive	146	27.88±0.48		
	Definitely positive	6	30.67±2.55		
Reactivity	Definitely negative	5	29±0.89	4.88	0.181
	Negative	55	24.34±1.03		
	Positive	146	24.91±0.47		
	Definitely positive	6	23.17±1.19		
High-intensity pleasure	Definitely negative	5	30.40±2.11	0.64	0.591
	Negative	55	29.40±0.99		
	Positive	146	30.58±0.41		
	Definitely positive	6	31.17±1.14		
Low-intensity pleasure	Definitely negative	5	39±3.78	6.07	0.108
	Negative	55	46.18±1.56		
	Positive	146	48.45±0.59		
	Definitely positive	6	50.67±1.05		
Impulsivity	Definitely negative	5	20±5.12	6.32	0.097
	Negative	55	27±1.10		
	Positive	146	29.09±0.39		
	Definitely positive	6	28.33±2.50		

SD: Standard deviation

during examination and treatment interventions. In other words, it can be said that good and appropriate interaction of a child with the therapist, especially the dentist, can contribute to the success of diagnostic and treatment measures. If children's behavior is properly evaluated before beginning of dental treatment, it can be possible to predict their performance. The mean score of positive anticipation was significantly higher in children with a completely negative and completely positive behavior than others. The mean scores of concentration, high-intensity pleasure, low-intensity pleasure, reaction, and smile in children with a rather positive behavior were higher than other children. However, this difference was not significant. Pinkham *et al*. argued that the level of cooperation in children with higher self-confidence was much better than those with lower self-confidence.[3]

CONCLUSION

The results indicated that girls had a better mean score of temperament than boys. Inhibitory control

and perceptual sensitivity scores in children with a completely positive behavior was significantly high. Accordingly, the mean scores of fear and anger were significantly higher in children with completely negative behaviors. In fact, these indicators can be used to predict the behavior of children, prior to examination and treatment measures.

Acknowledgement

This study was part of a thesis for DDS degree in Guilan University of Medical Sciences, School of Dentistry, and was financially supported by this university.

Financial support and sponsorship

This study was part of a thesis for DDS degree in Guilan University of Medical Sciences, School of Dentistry, and was financially supported by this university.

Conflicts of interest

The authors of this manuscript declare that they have no conflicts of interest, real or perceived, financial or nonfinancial in this article.

REFERENCES

1. Ghasempoor M, Ahmadi MH, Vali MP. Dental stress in children 6 to 12 years old and factors affecting it. J Babol Uni Med Sci 2004;3:12-6.
2. Hetherington E. Child Psychology a Contemporary View Point. 5th ed. Boston: McGraw Hill Co.; 1999. p. 462-3, 78-9.
3. Pinkham J, Casamassimo P, Fields H, McTigue D, Nowak A. Pediatric Dentistry: Infancy Through Adolescence. 5th ed. New York: W.B. Saundres; 2013.
4. Kaplan HI, Sadock BJ. Synopsis of Psychiatry: Behavioral Sciences Clinical Psychiatry. 5th ed. US: Williams and Wilkins Co; 1988.
5. Tabatabaie SM. Evaluation of easy and difficult behavior and some related factors in one hundred 3-6 year old children visited in Mashhad dental school. J Dent Mashhad Univ Med Sci 2005;28:205-10.
6. Tate AD, Trofholz A, Rudasill KM, Neumark-Sztainer D, Berge JM. Does child temperament modify the overweight risk associated with parent feeding behaviors and child eating behaviors?: An exploratory study. Appetite 2016;101:178-83.
7. Jamali Z, Vatandoost M, Erfanparast L, Aminabadi NA, Shirazi S. The relationship between children's media habits and their anxiety and behaviour during dental treatment. Acta Odontol Scand 2018;76:161-8.
8. Shinde SD, Hegde RJ. Evaluation of the influence of parental anxiety on children's behavior and understanding children's dental anxiety after sequential dental visits. Indian J Dent Res 2017;28:22-6.
9. Brill WA. Child behavior in a private pediatric dental practice associated with types of visits, age and socio-economic factors. J Clin Pediatr Dent 2000;25:1-7.
10. Brill WA. Behavior of pediatric dental patients throughout the course of restorative dental treatment in a private pediatric dental practice. J Clin Pediatr Dent 2001;26:55-60.
11. McDonald R, Avery D. Dentistry for the Child and Adolescent. 11th ed. London: Mosby; 2016.
12. Morgan AG, Rodd HD, Porritt JM, Baker SR, Creswell C, Newton T, *et al.* Children's experiences of dental anxiety. Int J Paediatr Dent 2017;27:87-97.
13. Klingberg G, Vannas Löfqvist L, Bjarnason S, Norén JG. Dental behavior management problems in Swedish children. Community Dent Oral Epidemiol 1994;22:201-5.
14. Veerkamp JS, Gruythuysen RJ, van Amerongen WE, Hoogstraten J. Treating fearful children: Does a parent's view of the child's fear change? ASDC J Dent Child 1994;61:105-8.
15. Appukuttan DP. Strategies to manage patients with dental anxiety and dental phobia: Literature review. Clin Cosmet Investig Dent 2016;8:35-50.
16. Rothbart MK, Ahadi SA, Evans DE. Temperament and personality: Origins and outcomes. J Pers Soc Psychol 2000;78:122-35.
17. Aminabadi NA, Puralibaba F, Erfanparast L, Najafpour E, Jamali Z, Adhami SE. Impact of temperament on child behavior in the dental setting. J Dent Res Dent Clin Dent Prospects 2011;5:119-22.
18. Aminabadi N, Ghoreishizadeh A, Ghoreishizadeh M, Oskouei S, Ghojazadeh M. Child temperament is as strongly associated with early childhood caries (ECC) as poor feeding practices: Positivetemperament appears protective, negative temperament May increase ECC risk. J Evid Based Dent Pract 2014;4:85-2.
19. Abanto J, Vidigal EA, Carvalho TS, Sá SN, Bönecker M. Factors for determining dental anxiety in preschool children with severe dental caries. Braz Oral Res 2017;31:e13.
20. Peretz B, Efrat J. Dental anxiety among young adolescent patients Israel. Int Pacdiatr Dent 2000:10:126-32.
21. Tabatabaee SM. Evaluation of easy and difficult behavior and some related factors in one hundred 3-6 year old children visited in Mashhad dental school. J Dent Mashhad Univ Med Sci 2004;28:205-10.
22. Rueda MR, Rothbart MK. The influence of temperament on the development of coping: The role of maturation and experience. New Dir Child Adolesc Dev 2009;2009:19-31.
23. Slobodskaya H, Safronova M, Windle M. Personality, temperament and adolescent adjustment in modern Russia. Pers Individ Dif 2005;39:167-78.
24. Klingberg G. Dental fear and behavior control problems. In: Koch GP. Pediatric Dentistry: A Clinical Approach. 2nd ed. US: Wiley-Blackwell; 2009. p. 47.
25. Javadinejad S, Tahmourespour S, Ghasemi D, Fatemeh Yazdi D. The relationship between 6 to 8 year old children's dental fear and their parents' fear. Knowl Res Appl Psychol 2013;4:85-91.
26. Kyritisi M, Dimou G, Lygidakis N. Parental attitudes and perceptions affecting childrens dental behavior in Greek population, A clinical study. Eur Arch Paediatr Dent 2009;10:29-32.