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ARTICLE

COMPARATIVE STUDY ABOUT THE FACTORS ASSOCIATED WITH PARENTAL DENTAL ANXIETY IN A PERUVIAN HOSPITAL.

Estudio comparativo de factores asociados con la ansiedad dental parental en un hospital peruano.

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ABSTRACT:

Background: Dental anxiety is a source of problems in the dental treatment that can lead to dental avoidance.

Objective: Determine and compare the factors associated with dental anxiety in Peruvian parents.

Material and Methods: An observational, descriptive and cross-sectional study was carried out. The sample consisted of children from 3 to 6 years old and their companions, who attended the Instituto Nacional de Salud del Niño in Lima, Peru. The Corah anxiety scale, the dental fear questionnaire and the Frankl scale were used to assess anxiety, parental dental fear, and children's collaboration. The following variables were also evaluated: negative dental experience, treated tooth and treatment of the children. Chi-square statistical tests, Mann-Whitney U and the binary logistic regression model were used.

Results: The sample consisted of 325 children and their companions. An association was found between gender (OR = 2.456; 95% CI: 1.037 - 5.818), child collaboration (OR = 0.044; 95% CI: 0.044 - 0.543) and maternal anxiety ($p < 0.05$). Furthermore, there was an association between dental fear (OR = 3.569; 95% CI: 1.136 - 11.218), child collaboration (OR = 0.023; 95% CI: 0.003 - 0.172) and paternal anxiety ($p < 0.05$).

Conclusion: The factor associated with maternal dental anxiety was the sex of the child, and on the father's side, it was the dental fear experienced by them. Moreover, the component affiliated with both parents was the child's collaboration.

KEYWORDS:

Behavior; parents; dental anxiety; child; tooth, deciduous; association.

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RESUMEN:

Introducción: La ansiedad dental es una fuente de problemas en el tratamiento odontológico que puede conducir a la evitación dental.

Objetivo: Determinar y comparar los factores asociados a la ansiedad dental en padres peruanos.

Material y Métodos: Se realizó un estudio observacional, descriptivo y transversal. La muestra estuvo compuesta por niños de 3 a 6 años de edad y sus acompañantes que asistieron al Instituto Nacional de Salud del Niño en Lima, Perú. Se usó la escala de ansiedad de Corah, el cuestionario de miedos dentales y la escala de Frankl para evaluar ansiedad, miedo dental parental y colaboración de los niños respectivamente. También se evaluaron las siguientes variables: experiencia dental negativa, pieza dental tratada y tratamiento de los niños. Se utilizaron las pruebas estadísticas de Chi-cuadrado, U de Mann-Whitney y el modelo de regresión logística binaria.

Resultados: La muestra estuvo conformada por 325 niños y sus acompañantes. Se encontró una asociación entre el sexo (OR =2.456; 95%IC: 1.037 – 5.818), colaboración del niño (OR=0.044; 95%IC: 0.044 – 0.543) y la ansiedad materna ($p<0.05$). Se encontró una asociación entre el miedo dental (OR= 3.569; 95% IC: 1.136 – 11.218), colaboración del niño (OR= 0.023; 95% IC: 0.003 – 0.172) y la ansiedad paterna ($p<0.05$).

Conclusión: El factor asociado a la ansiedad dental materna fue el sexo del niño, y en el padre, fue el miedo dental experimentado por el mismo. El factor asociado a ambos padres fue la colaboración del niño.

PALABRAS CLAVE:

Conducta; padres; ansiedad al tratamiento odontológico; niño; diente primario; asociación.

INTRODUCTION.

Dental anxiety has been established as the fifth most prevalent cause of anxiety.[1] t is estimated that the prevalence of restrained and high dental anxiety within the adult population is 19% and 6.82%.[2] In the parent's population, the highest occurs in mothers.[3] For a lot of time, it has been recognized as a source of problems in the behavior management of child patients, since it interferes with the adherence to the treatment. This arises as a consequence of uncooperative behavior, increasing its operating costs due to the need for treatment in the ward of operations. Into the bargain, it has been shown that the effects of this anxiety persist into adulthood, which can often lead to dental avoidance,[2] and consequently, to the deterioration of oral health. Thus it becomes a barrier that prevents patients from receiving adequate dental care.[4]

Previous studies have suggested that a child's dental anxiety is mainly influenced by maternal dental anxiety.[5] Nevertheless, as modern society evolves, the conventional structure of the family changes. Both parents participate equally in the child's education, so dental anxiety in children can be equally influenced by both parents. This topic has received little attention in the scientific literature.[6] In Peru, there is an absence of studies evaluating parental dental anxiety. This information is essential to create effective measures that promote the well-being of parents and children in the dental environment; and to avoid a decrease on oral health and life's quality.[1]

Therefore, dentists must recognize the presence of dental anxiety and not only consider the oral condition of the patients, but also the psychological and emotional status. Finally, the objective of this

study was to determine and compare the factors associated with dental anxiety in Peruvian parents.

MATERIALS AND METHODS.

An observational, analytic and cross-sectional study was developed from September to November 2020. The population consisted of 2118 children between the range of 3 and 6 years old and their parents who attended the office of the pediatric dentistry area of the Instituto Nacional de Salud del Niño (INSN), located in Lima, Peru.

These were selected by systematic and probabilistic sampling. The third person was chosen from the list of appointments of the day and so on, until the sample was finally completed. To determine the sample size, a confidence level of 1.96, a precision of 5% and a prevalence of parents' dental anxiety of 0.5, were used.

The patients were received in the waiting room of the pediatric dentistry area, where the inclusion and exclusion criteria were verified in the clinical history. The children considered were to be continuing patients of the institute, whose parents or parent signed the informed consent as an inclusion criteria. Children who had some type of disability (physical, motor, etc.) or some systemic disease were excluded. The outcome variable used in the study was dental anxiety and the exposure variables were dental fear of the parents, negative dental experience, collaboration, treated tooth and treatment of the children (pulpotomy, pulpectomy); as well as the age and gender of both groups. These variables were recorded in a data collection sheet.

Subsequently, the parents filled out two surveys given by the main researcher: the Corah dental anxiety scale and the dental fear questionnaire, where it was verified that all the questions had been answered correctly. The Corah anxiety scale is made up of four questions with five Likert-type response alternatives, with a minimum score of 4 and a maximum of 20.

Each question represents a situation related to the dental visit. The respondent was asked to answer with the option that was more similar to their behavior in each situation. It was classified according to the score as low anxiety (<11), moderate anxiety ,[12-14] and extremely anxious (≥15).[7]

The dental fear questionnaire consists of 20 questions about specific stimulus situations related to dental treatment, in which the subject scores the fear experienced on a scale ranging from 0 (no fear) to 5 (very fearful). The total score can be in a range of 0 - 100. Fear is classified according to the arithmetic mean of the sum of the total scores, if it is less than 2.5, it is considered little or no fear and if it is greater than 2.5, fear is considered medium or high.[8] Reliability was determined in both, with a sample of 30 parents, days prior to the execution of the study, in a primary health center, having a cronbach's alpha of 0.914 and 0.966 respectively.

The researcher explained to the parents the treatment to be carried out according to the definitive diagnosis obtained from the clinical and radiographic characteristics of the tooth. Once the treatment was authorized by the parents, the child and their parent entered the dental office, where the main researcher carried out the treatment using desensitization as behavior management; to avoid bias. All the treatments carried out had a protocol and the parent was present throughout the treatment. At the end, the child's collaboration was rated according to the Frankl scale.

This scale consists of four categories which rate the behavior of the child. Score 1 corresponds to "Definitely negative: total rejection to the treatment. Screams, cries and does not cooperate"; Score 2 corresponds to "Negative: he accepts the treatment with great difficulty, he is surly, distant and absent". These two scores are considered bad behaviors or low cooperation during care. On the other hand, Score 3 corresponds to "Positive: cautiously accepts the treatment, obeys and is anxious"; and the Score 4 to "Definitely positive: laughs, cooperates, enjoys and even is interested in the treatment". These two last scores are considered as good behaviors.[9]

The statistical program SPSS version 25 (IBM Corp., Armonk, NY, USA) was used to process the information of the collected data. For the categorical

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and numerical variables, the frequency distribution (percentages) and the mean (standard deviation) were used respectively. The collaboration variable was categorized into non-collaborative (if the child had a definitely negative and negative Frankl) and collaborative (if the child had a positive and definitely positive Frankl). Chi-square and Mann-Whitney U statistical tests were used to determine the statistical difference of the variables between mothers and fathers.

The difference between anxiety was determined according to the gender of the parents, where the value of p <0.05 determined the entry of the variables to the regression model. Due to statistical analysis, moderate anxiety and extremely anxious were combined in a single variable (high anxiety). In some cases (gender, negative dental experience, treated tooth and dental treatment of the child), Fisher's exact test was used. Furthermore, the binary logistic regression model was used to evaluate the association between dental anxiety and the variables chosen for the study. A $p<0.05$ was considered statistically significant.

To carry out this study, the approval of the NIHC ethics committee (PI-76/2018) was obtained. The confidentiality of the data obtained using codes was ensured. Due to the context of the pandemic caused by COVID-19, all biosafety measures were guaranteed both for the patients and their companions and for the researchers who participated in this research, following all the rules established by the Peruvian government's health ministry.

Table 1. Descriptive statistics of the study variables according to the gender of the parents (n = 325).

	Parents		Mother (n = 144)	Father (n = 181)	p-value
Parent	Age[a]		29.34 ± 4.5	29.78 ± 4.37	0.591
	Dental anxiety	Low	118 (81.9%)	98 (54.1%)	
		Moderated	20(13.9%)	42 (23.2%)	<0.0001*
		Extremely anxious	6 (4.2%)	41 (22.7%)	
	Dental fear	Scarse or low	43 (29.9%)	19 (10.5%)	<0.0001*
		Medium or elevated	101 (70.1%)	162 (89.5%)	
Child	Gender	Female	92 (63.9%)	64 (35.4%)	<0.0001*
		Male	52 (36.1%)	117 (64.6%)	
	Age[a]	4.59 ± 1.01	4.70 ± 1.08	0.352	
	Number of dental visits[a]	1.35 ± 0.48	1 ± 1.24	0.11	
	Negative dental experience	No	129 (89.6%)	165 (91.2%)	0.7713
		Yes	15 (10.4%)	16 (8.8%)	
	Collaboration	Did not collaborate	87 (60.4%)	142 (78.5%)	<0.0001*
		Did collaborate	57 (39.6%)	39 (21.5%)	
	Treated tooth	Anterior	26 (18.1%)	31 (17.1%)	0.9427
		Posterior	118 (81.9%)	150 (82.9%)	
	Dental treatment	Without anesthesia	15 (10.4%)	17 (9.4%)	0.9041
		With anesthesia	129 (89.6%)	164 (90.6%)	

Mann-Whitney U test, * p <0.001 - statistically significant

Table 2. Bivariate analysis of the study variables according to the of the parents and the degree of anxiety (n = 325)

			Mother		p-value	Father		p-value
			Low anxiety (n = 118)	High anxiety (n = 26)		Low anxiety (n = 98)	High anxiety (n = 83)	
Parents	Age[a]		29.06 ± 4.38	30.62 ± 4.89	0.618	30.62 ± 4.91	28.78 ± 3.41	0.423
	Dental fear	Scarse or low	39 (33.1%)	4 (15.4%)	0.12	15 (15.3%)	4 (4.8%)	0.04*
		Medium or elevated	79 (66.9%)	22 (84.6%)		83 (84.7%)	79 (95.2%)	
Child	Gender[b]	Female	80 (67.8)	12 (46.2%)	0.04*	37 (37.8%)	27 (32.5%)	0.56
		Male	38 (32.2%)	14 (53.8%)		61 (62.2%)	56 (67.5%)	
	Age[a]		**4.59 ± 1.02**	**4.62 ± 1.02**	**0.045***	**4.79 ± 1.08**	**4.59 ± 1.07**	**0.894**
	Number of dental visits[a]		**1.16 ± 1.08**	**1.42 ± 1.65**	**0.234**	**1 ± 0.48**	**1 ± 0.79**	**0.137**
	Negative dental	No	107 (90.7%)	22 (84.6%)	0.48	91 (92.9%)	74 (89.2%)	0.54
	experience[b]	Yes	11 (9.3%)	4 (15.4%)		7 (7.1%)	9 (10.8%)	
	Collaboration	Did not collaborate	64 (54.2%)	23 (88.5%)	0.003*	64 (65.3%)	78 (94%)	<0.0001**
		Did collaborate	54 (45.8%)	3 (11.5%)		34 (34.7%)	5 (6%)	
	Treated tooth[b]	Anterior	18 (15.3%)	8 (30.8%)	0.09	15 (15.3%)	16 (19.3%)	0.61
		Posterior	100 (84.7%)	18 (69.2%)		83 (84.7%)	67 (80.7%)	
	Dental treatment[b]	Without anesthesia	12 (10.2%)	3 (11.5%)	0.74	12 (12.2%)	5 (6%)	0.24
		With anesthesia	106 (89.8%)	23 (88.5%)		86 (87.8%)	78 (94%)	

Mann-Whitney U test, bFisher's exact test, * p <0.05, ** p <0.001 - statistically significant

RESULTS.

The sample consisted of 325 children and their parents, the average age of the boys and girls was 4.59±1.06 and 4.72±1.04 years. The type of collaboration that occurred most frequently was definitely negative (44.6%) and the most prevalent diagnosis was irreversible pulpitis (75.7%). The most frequent treatment was pulpectomy (90.2%), the anterior and posterior tooth treated most frequently was the upper right deciduous central incisor (3.4%) and the lower left deciduous first molar (17.8%) respectively. The descriptive statistics of the study variables according to the sex of the parents are summarized in Table 1, of these, the anxiety and dental fear of the parents, gender and collaboration of the child had a value of $p<0.05$ in the test Chi squared. The descriptive statistics of the study variables according to the gender of the parents and dental anxiety are summarized in Table 2. For the mother, the gender and age of the child, as well as their collaboration, had a value of $p<0.05$ in the chi-square test and Mann-Whitney U test. For the father, the variables, dental fear and child's collaboration had a value of $p<0.05$ in the chi-square test.

In table 3, an association was found between gender (OR = 2.456; 95% CI: 1.037 - 5.818), child collaboration (OR = 0.044; 95% CI: 0.044 - 0.543) and maternal anxiety ($p<0.05$). As the OR <1, the latter was considered a protective factor.

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In table 4, an association was found between dental fear (OR = 3.569; 95% CI: 1.136 - 11.218), child collaboration (OR = 0.023; 95% CI: 0.003 - 0.172) and paternal anxiety ($p< 0.05$). As the OR <1, the latter was considered a protective factor.

DISCUSSION.

It is important to recognize the dental anxiety of our patients in order to avoid its influence on dental treatments. The family environment can also be an important variable in establishing the multifactorial etiology of dental anxiety. Parental behavior and attitudes are a key factor that affect the child's behavior in the office.[10] There is research that shows the influence of parental dental anxiety on children's anxiety and fear[11] although there are also authors who claim the opposite,[12] generating this topic, even some controversy. The influence of parental behavior is very strong in preschool-age children. The factors related to the norms, knowledge and behavior of parents contribute to the development of negative behavior in children towards dental health[13] since there is an emotional relationship that affects the psychological aspects of the child.[10] On this is based, for example, the non-pharmacological behavior technique parent-in-parent-out[14] that explains the presence or absence of parents during dental treatment.

In this study, parents were the ones who frequently accompanied their children to the dental consultation, unlike the results presented by Gavic *et al.*,[15] where the mother is the regular companion. Busato *et al.*,[16] concluded that there is a closer association between the levels of anxiety of the mother and the child compared to the father, this can be explained by the attachment theory, which motivates people to bond with others in their environment and look for them when they are distressed. Even though in recent times, fathers have also become more involved in raising their children, mothers are still the main "attachment figure" for everyone, that is why we speak of the mother-child dyad.[11]

It was found that fathers presented more anxiety than accompanying mothers, contrary to what was published by Folayan *et al.*,[3] where mothers present greater anxiety. White *et al.*,[2] reported that women had an anxiety score 2.12 times higher than men ($p<0.05$). Regarding fear, both presented little or no difference to the result presented by Felemban *et al.*,[17] where mothers presented more dental fear than fathers. In multiple investigations, it has been considered that female patients are more anxious or have a higher degree of anxiety than male patients, as published by Zinke *et al.*,[18] In this study, it should be noted that only parental dental anxiety and fear were associated; the probability that a father had dental anxiety in the group with medium or high fear was 3.6 times that of the group with little or no dental fear. The greater the dental fear that the father presents, the greater the dental anxiety, this is explained because both concepts are similar.[1]

As for the factors associated with dental anxiety in parents, the study did not find an association with the dental treatment of children, similar to that found by Busato *et al.*,[16] and contrary to what was published by AlQhtani *et al.*,[19] where it concludes that parents get anxious when children are undergoing dental treatment, in addition, the author mentions, this is a poorly documented topic. The factors associated with maternal anxiety was associated with the gender of the child, the probability of presenting maternal anxiety in the group that had children was 2.5 times that of the group that had daughters, although several studies report that the girls are more anxious than boys.[1] This pattern is maintained in the adult population.[20]

Another point that is associated with parental anxiety was the child's collaboration. The probability of presenting maternal anxiety in the group of children who collaborated was 80% less compared to the group of children who did not collaborate, unlike paternal anxiety, where the probability was 98% less. It follows that the collaboration of children is more associated with mothers than with fathers; the greater the children's collaboration is, the less anxiety the parents will present. Likewise, maternal dental anxiety negatively affects the

child's behavior.[21,22] So it becomes a cycle, whose importance lies in the dental experience of children as well as that of parents because both influence each other.

One of the limitations of the research was to use surveys to measure parental fear and anxiety, since there are other more objective tools such as the use of heart rate monitoring, oxygen saturation, and more. However, the use of a standardized questionnaire is more economical and feasible to use (the Corah dental anxiety scale is the most widely accepted and used). However, in the practice, only a small percentage of dentists use some form of evalu-ation technique to rate dental anxiety. In a higher percentage, they trust their experience and intuition, generally called "clinical eye" and it is used to evaluate the level of dental anxiety of a patient[4] or it is simply not evaluated. Thus, valuable information is lost to improve behavior management in pediatric dentistry. The results of this study can be extrapolated to populations with similar characteristics to those studied in this research.

CONCLUSION.

The factor associated with maternal dental anxiety was the gender of the child, and in the father, it was the dental fear experienced by the child. The component related to both parents was the child's collaboration.

Hence, it is crucial to control the factors and reduce parental anxiety, in order to avoid its influence on children's behavior and to optimize dental treatment. In addition, it is also important to plan the most appropriate and effective behavior management techniques for pediatric patients and to select simple and atraumatic treatment procedures because the children's lack of cooperation affects their parents.

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Conflict of interests:

There is no conflict of interest.

Ethics approval:

Study was approved by the ethics committee of the Instituto Nacional de Salud del Niño, (PI-76/2018).

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Authors' contributions:

Munayco-Pantoja E: Contributed with the conception, design, analysis and interpretation of data and writing of the manuscript.

Cadillo-Ibarra M: Contributed to the conception and data collection.

Torres-Ramos G: Contributed to the design and critical review of the manuscript.

Blanco-Victorio D: Contributed with the analysis and interpretation of statistical data.

All authors gave their final approval and agreed to be responsible for all aspects of the work.

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