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Dental Anxiety in Relation to Emotional and Behavioral Problems in Croatian Adolescents

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A B S T R A C T

The investigation was performed on 113 adolescents in the age between 15 and 18 years (63 boys, 50 girls). Corah Dental Anxiety Scale (CDAS) and Children's Fear Survey Schedule – Dental Subscale (CFSS-DS) were used for evaluation of dental fear and Child Medical Fear Questionnaire (CMFQ) for evaluation of the fear of medical treatment. Achenbach Youth Self Report questionnaire (YSR) was used for evaluation of emotional and behavioral problems. The tests were filled in by children. The aim of the study was to evaluate the level of dental anxiety in adolescents and to assess a cause – consequence relationship between dental anxiety and emotional and behavioral problems in adolescents. The results of CDAS, CFSS-DS and CMFQ tests showed that dental anxiety scores and the total internalizing problems were higher in girls. Girls displayed more physical problems ($p<0.001$) and were more prone to anxiety/depression disorders ($p<0.05$). Both boys and girls were more agressive, more prone to delinquent behaviour and had more externalizing problems in comparison with the average values obtained for the Croatian population. Significant correlation coefficients for boys were calculated for age and anxiety/depression, and delinquent behaviour and aggression ($p<0.05$). Significant correlations were observed between physical problems and dental anxiety measured by the CFSS-DS test ($p<0.01$), and between physical problems and the total internalizing problems ($p<0.05$). In girls, the CMFQ scores showed significant correlations between dental anxiety and physical problems ($p<0.05$), and anxiety/ depression ($p<0.01$) and the total internalizing and externalizing problems ($p<0.05$). Significant correlations were calculated for age and the total internalizing and externalizing problems for boys ($p<0.05$). According to the results of both CDAS and CMFQ tests, anxiety in girls showed significant correlations with delinquent behaviour ($p<0.01$). CDAS scores for girls showed significant correlations with aggression ($p<0.05$) and the total externalizing problems ($p<0.01$).

Key words: *dental anxiety, emotional and behavioral problems, adolescents*

Introduction

Dental anxiety has been considered as a source of various problems in a child patient management. It often leads to cancelled dental appointments and more decayed teeth, and has detremental consequences for the oral health in adulthood. Recent studies on the prevalence of dental anxiety have estimated that there is still quite a percentage of youngsters who are anxious about dental procedures. The prevalence of dental anxiety in general population is over 10%[1,2,3]. Moreover, the percentage prevalence estimations of childhood dental fear show considerable variations from 3% to 43%, due to either methodological or cultural variables in the present studies[4–9]. The prevalence of behavioral and emotional problems in adolescensts, ranges from 6.2% to 41.3%, and seems to have tendency to increase[10]. Preliminary studies show that emotional problems in Croatian children and adolescents are similar to those of adolescents in Europe and transitional countries as well[10].

Despite of the dentists' attempt to influence negative patterns of individual behaviour, there are some adolescents who don't respond to any behaviour modificaton

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and are not able to have the dental treatment accomplished. Apparently, such fears can be identified as: psychological, cognitive or emotional.

Diagnostic criteria among adolescents arise a specific problem when information is given by different sources. The important issue in diagnostic criteria in adolescents is how to detect children and adolescents with behavioral and emotional problems. It is known that certain ethiological and treatment variables are related to the anxiety level, but it is important to find out if diagnostic criteria play an important role in relation to the anxiety level as well. In the attempt to obtain data on changing patterns in adolescent behaviour and psychopathology, different measurements have been used[10]. Parents might provide important information considering their own child's behaviour, although adolescents seem to be competent enough to give information about themselves. Empirical data using standardized tests have shown that one of the widely accepted instruments in detecting behavioral and emotional problems in adolescents is also the Youth Self Report (YSR) questionnaire and the tests derived from it[11].

The aim of this study was to evaluate dental anxiety among adolescents, as well as a possible relationship between dental anxiety and the existing internalizing and externalizing problems in adolescents in Croatia.

Materials and Methods

Participants were 113 adolescents, (63 boys and 50 girls). Their age ranged from 15 to 18 years, (average 16.6 for boys and 16.2 for girls). Participants were selected from a high school in a suburban area of the city of Zagreb, Croatia. The study was performed by using standard questionnaires for evaluation of dental anxiety as well as emotional and behavioral problems in children/adolescents. Participants were asked to fill in the questionnaires themselves. Due to the complex nature of dental anxiety it is advised by researchers to use more than one questionnaire since they measure different domains of dental anxiety.

Children Fear Survey Schedule – Dental Subscale (CFSS –DS), Corah Dental Anxiety Scale (CDAS) and Child Medical Fear Questionnaire (CMFQ) were the tests used for evaluation of dental/medical fears in adolescents, as well as Achenbach Youth Self – Report questionnaire (YSR) for evaluation of their emotional and behavioral problems.

The *Children Fear Survey Schedule – Dental Subscale (CFSS-DS)* test, consisting of 15 questions, was used for evaluation of dental anxiety in adolescents.[12] The questions refer to some general as well as specific aspects of dental/medical situations. Each of the 15 questions is rated on a 5-point scale and the final score can range from the minimun 15 to the maximum 75. Participants with the final score equivalent or higher than 39 can be regarded as extremely dentally anxious[12].

The *Corah Dental Anxiety Scale* (CDAS) test was used for evaluation of a patient's fears regarding waiting in the waiting room, sitting in the dental chair and having had dental procedures done[13]. Each of 4 questions is rated on a 5-point scale and the final score can range from 4 to 20, according to which anxious participants can be arranged in a low, moderate or high anxiety groups.

The *Child Medical Fear Questionnaire (CMFQ)* test was performed for evaluation of medical and dental fears[14]. The questions refer to one's fears evoked in different medical and/or dental situations. The assumption is that children/adolescents afraid of medical procedures are expected to consequently anticipate dental fear in stressfull dental situations. The questionnaire consists of 12 questions, which are scored on a 3-point scale.

The *Achenbach Youth Self Report Scale (YSR)* was the questionnaire used for evaluation of adolescents' emotional and behavioral problems[15–17]. The YSR test consists of 102 questions, which describe possible problems and combine alltogether eight scales or syndromes. Each of the broadband scale is consisted in either an Internalizing or an Externalizing Problem Scale, which together form a Total Problem score.

Statistical analysis

Statistcal analysis was performed by using STATISTICA for Windows Release 5.5 A and SPSS for Windows, Release 7.5. The differences in dental anxiety between boys and girls were performed by calculating the mean scores, which were compared by using an independent *t-test*. Adolescents' consistency concerning dental anxiety tests and the problem scales was verified by using *Spearman's correlation* coefficients. The differences regarding emotional and behavioral problems between the examined population and the Croatian sample were performed by calculating mean scores.

Results

Dental anxiety in both males and females was significantly different regarding gender as measured by all three questionnaires used in the study.

A significant difference in the anxiety scores between males and females was acquired by using CFSS – DS and CMFQ questionnaires ($p<0.001$), as well as when CDAS was applied ($p=0.001$) (Table 1).

It was quite interesting to compare the results of this study with the results of the previous studies referring to the Croatian sample (Table 2). The scores obtained in the present study seemed to be in accordance with the results representing the Croatian mean score, with the exception of the results referring to delinquent behaviour and aggression. (Table 2) It was clear that the results of both male and female participants in the present study differed significantly regarding the mentioned syndrome scales (Table 2). According to the results of this study, males exhibited more delinquent behaviour ($\bar{x}=9.94$) and were more aggressive ($\bar{x}=10.92$) in comparison with the

TABLE 1
DIFFERENCES IN ANXIETY SCORES (CFSS – DS, CDAS AND CMFQ) BETWEEN MALES AND FEMALES

Variable	Gender	N	X	SD	t	df	p
CFSS-DS	Male	63	23.40	7.69	3.70	111	<0.001
	Female	50	29.90	10.96			
CDAS	Male	63	8.65	3.00	3.303	111	0.001
	Female	50	10.86	4.11			
CMFQ	Male	63	16.48	1.73	3.89	111	<0.001
	Female	50	18.06	2.58			

CFSS-DS – Children Fear Survey Schedule – Dental Subscale, CDAS – Corah Dental Anxiety Scale, CMFQ – Child Medical Fear Questionnaire, t – t value for independent samples t test

mean results obtained for the Croatian sample referring to delinquent behaviour ($\bar{x}$=3.49) and aggression ($\bar{x}$= 7.77) respectively (Table 2).

Females too seemed to be more aggressive ($\bar{x}$=10.02) and more prone to delinquent behaviour ($\bar{x}$=8.40) in comparison with the mentioned syndrome scales obtained for the Croatian sample, i.e. delinquent behaviour ($\bar{x}$=2.72) and aggression ($\bar{x}$=8,58) respectively (Table 2).

The results shown in Table 3 showed a correlation between the level of dental anxiety and the internalizing and externalizing problems in both males and females. Physical problems (P-II) in boys were significantly correlated with dental anxiety measured by CFSS – DS questionnaire ($p<0.01$) and the total internalizing score (P-INT) in males was in a significant correlation with dental anxiety ($p<0.05$), as measured by the same questionnaire. Both total internalizing (P-INT) and externalizing (P-EXT) syndrom scores were correlated with age in male population ($p<0.05$), as well as anxiety/depression, delinquent behaviour and aggression ($p<0.05$) (Table 3).

As measured by CDAS, dental anxiety in females was significantly and strongly correlated with delinquent behaviour (P-VII) ($p<0.01$) and aggression (P-VIII) ($p<0.05$) (Table 3). The results of the CMFQ questionnaire showed that dental anxiety in females was significantly correlated with physical problems (P-II) and the total internalizing syndrom score (P-INT) ($p<0.05$), as well as with anxiety/depression (P-III) and delinquent behaviour (P-VII) ($p<0.01$). Subsequently, there was a significant correlation between the anxiety level and the total externalizing problem scale (P-EXT) in females measured by the CMFQ questionnaire as well ($p<0.05$) (Table 3).

The results of the Youth Self – Report questionnaire represented in Table 4 showed that adolescent girls had more physical problems than boys ($p=0.001$) and exhibited more anxious/depressive behaviour in comparison with boys ($p=0.046$). In total, according to the same results, female participants had more internalizing problems when compared to males ($p=0.010$). Results of the YSR scale representing withdrawal (P-I), delinquent behaviour (P-VII) and aggression (P-VIII), as well as the total externalizing score, were not significantly different regarding gender.

Discussion

The prevalence of emotional and behavioural problems in adolescents in the European countries range between 6 and 41 %.[10] The nature and interpretation of behavioural problems is difficult to assess, as well as to choose relevant diagnostic instruments which give insight in a child's mental health. Child's behaviour and the level of fears in diffrerent stressful situations might be of importance for the accomplishment of dental treatment.

Childhood fears show developmental changes through the years. It has been documented that some of these fears decrease or even disappear as children grow older. Different psychopathological signs can overlap. It also relates to anxiety which can overlap with different psychological symptoms, manifested through one's internalizing and externalizing behaviour problems. Therefore, it

TABLE 2
COMPARISON OF THE VALUES OBTAINED BY YOUTH SELF-REPORT (YSR) QUESTIONNAIRE FOR THE PRESENT SAMPLE AND NORMATIVE DATA FOR CROATIAN YOUTH

Variables	Mean value			
	Male		Female	
	X_a (N=408)	X_b (N=63)	X_a (N=590)	X_b (N=50)
Withdrawal (P-I)	3.07	3.08	3.84	3.32
Physical problems(P-II)	2.23	2.63	3.39	4.42
Anxiety/Depression (P-III)	4.72	4.83	6.72	6.20
Delinquent behaviour (P-VII)	3.49*	9.94*	2.72*	8.40*
Aggression (P-VIII)	7.77*	10.92*	8.58*	10.02*
Internalizing problems (P-INT)	9.79	10.54	13.53	13.94
Externalizing problems (P-EXT)	11.26	20.86	11.26	18.42

X_a – mean for Croatian population (Rudan et al., 2005), X_b – mean for the examined population, * $p < 0.01$ for mean difference

TABLE 3
CORRELATION COEFFICIENTS BETWEEN ANXIETY SCORES OBTAINED BY DIFFERENT INSTRUMENTS (MALES:LOWER TRIANGLE, N=63; FEMALES: UPPER TRIANGLE, N=50)

	AGE	P-I	P-II	P-III	P-VII	P-VIII	P-INT	P-EXT	CFSS-DS	CDAS	CMFQ
AGE	–	0.104	–0.002	0.211	0.237	0.054	0.147	0.154	0.189	0.153	0.059
P-I	–0.173	–	0.320*	0.403**	0.263	0.425**	0.687**	0.398**	–0.202	0.000	–0.024
P-II	–0.232	0.237	–	0.507**	0.277	0.311*	0.772**	0.334*	0.049	0.141	0.279*
P-III	–0.284*	0.356**	0.510**	–	0.306*	0.457**	0.867**	0.439**	0.083	0.120	0.406**
P-VII	0.270*	0.234	0.308*	0.027	–	0.562**	0.362**	0.859**	0.204	0.446**	0.373**
P-VIII	0.281*	0.340**	0.210	0.006	0.830**	–	0.511**	0.906**	0.164	0.342*	0.248
P-INT	–0.306*	0.666**	0.751**	0.858**	0.226	0.217	–	0.502**	–0.007	0.119	0.315*
P-EXT	0.288*	0.306*	0.264*	0.016	0.945**	0.967**	0.231	–	0.206	0.440**	0.344*
CFSS-DS	0.041	0.133	0.406**	0.189	0.210	0.132	0.310*	0.174	–	0.608**	0.595**
CDAS	–0.063	0.077	0.196	0.116	0.047	0.067	0.167	0.061	0.554**	–	0.478**
CMFQ	–0.036	0.021	0.323	0.083	0.057	0.085	0.179	0.076	0.446**	0.244	–

AGE – in years, P-I – withdrawal, P-II – physical problems, P-III – anxiety/depression, P-VII – delinquent behaviour, P-VIII – aggression, P-INT – internalizing problems, P-EXT – externalizing problems, CFSS-DS – Children Fear Survey Schedule – Dental Subscale, CDAS – Corah Dental Anxiety Scale, CMFQ – Child Medical Fear Questionnaire, * $p<0.05$, ** $p<0.01$

has been suggested to use different types of psychometric measurments for obtaining information on the child's behaviour problems.

This study represented an attempt to evaluate possible overlaping between the level of dental anxiety and emotional and behavioral problems in the adolescent Croatian population. The intention was also to assess reliability of the Youth Self report Scale (YSR) questionnaire in determening the level of anxiety in adolescents and to compare it with the results obtained by the instruments standardly used for assessing dental and medical anxiety in children.

The results in this study revealed significantly higher level of dental anxiety in girls than in boys (Table 1).

The results of this study were in accordance with the results obtained for the Croatian population. The existing differences compared to the Croatian sample were based on the scores representing delinquent behaviour and agression, in both boys and girls. It was expected to have significantly different scores on the externalizing problem scale in both genders as well (Table 2).

Discrepancies in the obtained results for the Croatian population could be explained as a possible consequence of the specific influences, i.e. psycological, socio-cultural

TABLE 4
RESULTS OF THE YOUTH SELF – REPORT QUESTIONNAIRE (YSR) IN RELATION TO GENDER

Variables	Gender	N	X	*s*	t	df	*p*
Withdrawal (P-I)	Male	63	3.08	2.44	–0.503	111	0.616
	Female	50	3.32	2.63			
Physical problems (P-II)	Male	63	2.63	2.48	–3.487	111	0.001
	Female	50	4.42	2.96			
Anxiety/Depression (P-III)	Male	63	4.83	3.27	–2.016	111	0.046
	Female	50	6.20	3.98			
Delinquent behaviour (P-VII)	Male	63	9.94	6.04	1.570	111	0.119
	Female	50	8.40	3.79			
Aggression (P-VIII)	Male	63	10.92	7.68	0.732	111	0.466
	Female	50	10.02	4.59			
Internalizing problems (P-INT)	Male	63	10.54	6.29	–2.612	111	0.010
	Female	50	13.94	7.54			
Externalizing problems (P-EXT)	Male	63	20.86	13.13	1.172	111	0.244
	Female	50	18.42	7. 2			

t – t value for independent samples t test

and biological as well, referring to specific surroundings in which those children have grown up. In adolescent age, some psychological characteristics might mask the real personality trait in an individual, i.e. introvert patients might be very anxious, although pretending to be extrovert in communication. This should be regarded as an important factor influencing behavior in adolescence. Furthermore, some traditional structures in the society, such as school, could change the way of traditional support. The influences coming from the outside might have different impact in adolescent age. The impact of possible transitional changes on the structure of a recent population, appearing as a consequence of constant migration in the state for the last decade, might influence these recent findings as well.

The results of this study were significantly different from those acquired for the American adolescent population. The American girls exhibited bigger problems concerning somatic complaints, attention problems, aggression and the total externalizing problem scales, which was more similar to some European findings.[17,18]

Correlation coefficients between anxiety scores approved of a significant cause – consequence relation, which might appear in adolescents in relation to gender and age. Positive correlations between certain anxiety scores suggested that delinquent behaviour (P-VII), aggression (P-VIII) and the total externalizing problems were expected in older boys. Negative correlations suggested that more anxiety/depression disorders (P-III) and the total internalizing problems were more manifested in younger boys. Boys with more physical problems and more total internalizing problems showed higher anxiety scores assessed by the CFSS – DS questionnaire (Table 3).

Adolescent girls reported more anxiety problems and more total externalizing problems, as measured by CDAS and CMFQ questionnaires (Table 3). Girls who were prone to delinquent behaviour were more anxious, but some of them could be aggressive as well (Table 3). Furthermore, it could be assumed that adolescent girls who suffered from anxiety/depression and/or physical problems were more prone to dental anxiety (Table 3).

According to the results representing the total internalizing problem scale of the YSR questionnaire, girls with more physical and anxiety/depression problems showed higher total internalizing problem disorders (Table 4).

The results of this study showed that girls were more ready to report on their problems than boys, which is in accordance with previous studies[11,19,20,21]. Psyhodynamic explanation suggests that intensive separation from family, influences development and greater need of autonomy of an individual child. Changing patterns of female behaviour lead to growing and intensifying reactions, which are more externally orientated and influenced by bad behaviour of others[11,17,22].

Conclusion

The results of the present study showed that there is a relation between the anxiety level and emotional/behavioral problems in Croatian adolescents. This has an important clinical relevance. Changes in a lifestyle for the last decades, have been responsible for more aggressive and delinquent behaviour, especially in the female population. Further studies have to clarify whether this is a general trend or a more specific local problem.

The study might raise a question of suitability of the YSR questionnaire in evaluating dental anxiety in relation to standard psychometric instruments such as CDAS and CFSS – DS questionnaires, which needs to be further investigated.

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DENTALNA ANKSIOZNOST, EMOCIONALNI PROBLEMI I PROBLEMI U PONAŠANJU U HRVATSKIH ADOLESCENATA

S A Ž E T A K

Istraživanje je provedeno na 112 adolescenata u dobi od 15 do 18 godina (62 dječaka, 50 djevojčica). Za evaluaciju dentalnog straha koristili su se Corah Dental Anxiety Scale (CDAS) i Children's Fear Survey Schedule – Dental Subscale (CFSS–DS) Upitnici, a za evaluaciju medicinskog straha Child Medical Fear Questionnaire (CMFQ). Achenbachov Youth Self Report upitnik (YSR) koristio se za evaluaciju emocionalnih problema i problema u ponašanju. Testove su ispunjavala djeca. Svrha istraživanja bila je procijeniti razinu dentalne anksioznosti u adolescenata, te uzročno-posljedičnu povezanost dentalne anksioznosti i emocionalnih problema te problema u ponašanju u adolescenata. CDAS, CFSS–DS i CFMQ upitnici su pokazali da su prosječne vrijednosti dentalne anksioznosti i totalnih internalizirajućih problema veći u djevojaka. Djevojke su pokazale više fizičkih problema ($p<0.001$) i sklonost glede poremećaja anksioznosti/depresije ($p<0.05$). Dječaci i djevojke su bili agresivniji, skloniji delinkventnom ponašanju i pokazali su više eksternalizirajućih problema u usporedbi sa prosječnim vrijednostima dobivenima za hrvatsku populaciju. Značajni koeficijenti korelacija u dječaka su izračunati za dob i anksioznost/depresiju, te delinkventno ponašanje i agresiju ($p< 0.05$). Značajna je korelacija ustanovljena između fizičkih problema i dentalne anksioznosti mjerene CFSS-DS testom ($p<0.01$), te fizičkih problema i totalnih internalizirajućih problema ($p<0.05$). U djevojaka, CMFQ test je pokazao značajnu povezanost između dentalne anksioznosti i fizičkih problema ($p<0.05$), te anksiznosti/depresije ($p<0,01$) i totalnih internalizirajućih i eksternalizirajućih problema ($p<0.05$). Značajne korelacije su izračunate za dob i totalne internalizirajuće i eksternalizirajuće probleme u dječaka ($p<0.05$). Prema rezultatima CDAS i CMFQ testova, dentalna anksioznost u djevojaka pokazala je značajne korelacije s delinkventnim ponašanjem ($p<0.01$). Rezultati CDAS testa u djevojaka pokazali su značajne korelacije s agresijom ($p<0.05$) i totalnim eksternalizirajućim problemima ($p<0.01$).