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Impact of Residence on Dental Fear and Anxiety in Romanian Children

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Abstract

Child dental fear and anxiety (DFA) is a worldwide problem with extremely diversified influencing factors and various prevalence. The aim of the present study was to evaluate dental fear and anxiety in Romanian children living in Romania and as a minority in Hungary in order to appreciate the importance of domicile on DFA. 713 schoolchildren between ages of 11-18-years, 406 from Romania and 306 from Hungary, were evaluated using Klineknecht's Dental Fear Scale (DFS), Getz's Dental Belief Scale (DBS) and Background Scale, respectively. The mean age of the surveyed sample was 14.8 ± 2.32 years. The mean scores DFS: 37.81 ± 14.24 , DBS: 37.37 ± 11.38 , Background Scale: 2.21 ± 2.63 indicate the presence of a moderate dental fear, with no statistically significant differences between the two samples. From the viewpoint of gender, males from Romania showed statistically significant differences in case of DBS compared to their fellows in Hungary. Considering age, the youngest children evaluated, the 11-year-olds were the least fearful, with the peak of DFA situated around age 12-

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14 years. We state that domicile did not have an effect on the level of dental fear in this case. A decrease in the severity of dental fear and anxiety was also observed. Significant distinctions between the two samples are present only in particular aspects of the questionnaires used.

Keywords: children, dental fear and anxiety, Romania, Hungary, communication, teenagers.

Introduction

Child dental fear and anxiety (DFA) is a behavioural problem that staff of dental offices has to face globally. Moreover, it is also accompanied with consequences, as it is directly linked with poor dental health both on the short and long term (Rotaru *et al.*, 2001; Răducanu *et al.*, 2009; Mărginean & Filimon, 2011; Milsom *et al.*, 2003).

The phenomenon of dental fear and anxiety is defined as a feeling of apprehension about dental treatment that is not necessarily connected to a specific stimulus. It appears in early childhood and its presence has been recorded in different countries and various ethnic groups (Folayan *et al.* 2004; Chapman & Kirby, 1999). The prevalence of dental fear and anxiety among children oscillates on a wide range worldwide. This could be on the one hand due to the different methodologies used. On the other hand, it reflects the interplay of factors and variables related to anxiety, which can be influenced also by the environment and culture. Culture is a shared system of attitudes and feelings, which may be defined as a system of common beliefs, values, customs, behaviours and artifacts that members of society use to cope with their surroundings. With its wide-ranging impacts, it is likely that the modulating effect of culture, in synergy with other variables contributes to the variation seen in reports of dental fear and anxiety between regions (Folayan *et al.* 2004; Chapman & Kirby, 1999). Romanian children have been assessed in different circumstances and with variable methods in the past years (Răducanu *et al.*, 2009; Mărginean & Filimon, 2011; Mărginean & Filimon, 2012; Lazar *et al.* 2012; Vaida *et al.*, 2007). The aim of the present study was to investigate dental fear and anxiety in Romanian children who live in Romania and as a minority outside the borders of the country, in Hungary. This may reflect the impact of living in a foreign country on the perception of dental fear and anxiety. Respectively, it could reveal the differences between dental care in the two neighboring countries.

Materials and methods

To achieve our objectives, we conducted a cross-sectional questionnaire-based study in two different locations. One of them took place in the central part of Romania and the other one, in the south-eastern part of Hungary, close to the Romanian border. The subjects of our survey were 713 schoolchildren of Romanian nationality between the ages 11-18 years. In total 320 males and 393 females were analyzed, from whom 406 subjects lived in Romania and 307 in Hungary.

Participation in the survey was voluntary with respect to anonymity. This was done after appropriate information about the study had been provided to the participants and also to their parents, who gave their written consent. The study was approved by the Research Ethics Committee of the University of Medicine and Pharmacy Tîrgu Mureş (42/14.03.2013) and by the Ethical Committee of Semmelweis University from Budapest (TUKÉB 8.9/2008), respectively.

For the assessment of dental fear and anxiety, we applied for Kleinknecht's Dental Fear Survey (DFS) (Kleinknecht *et al.*, 1973; Kleinknecht *et al.*, 1984), which has been validated in a previous survey (Mărginean & Filimon, 2011; Lazar *et al.*, 2012). The subjects' opinion about dentists was measured with Getz's Dental Belief Scale (DBS), already validated in Hungary (Gáspár *et al.*, 2003; Markovics *et al.*, 2005), but used for the first time in Romanian children. The Background Scale measured the dental fear of the child's environment (parents, siblings and friends).

The questionnaires were self-applied and on one occasion were completed in groups at school, after lessons. For statistical analysis t-test, one-way ANOVA and chi square test were used by the SPSS/PC Statistics 17.0 software (SPSS, Inc. Chicago, IL) with the level of significance set at $p \leq 0.05$.

Results

The mean age (\pm S.D) of the surveyed subjects was 14,8 \pm 2,32 years, 15,7 \pm 2,06 years for the sample living in Romania and 13,61 \pm 2,1 for the one living in Hungary, respectively. The mean scores of the surveyed subjects from the viewpoint of residence are presented in *Table 1*. The sample from Hungary showed slightly higher scores in case of DBS and lower scores in case of DFS and Background Scale, respectively, but the differences were not statistically significant ($p \leq 0.05$, independent t test).

Table 1. *Dental fear and anxiety scores of Romanian children from Romania and Hungary aged 11-18 years*

	Whole sample (n=713)	Romania (n=406)	Hungary (n=307)	p (≤ 0.05)
DFS	37.81 ±14.24	38.38 ±14.58	37.06 ±13.77	0.2207
DBS	37.37 ±11.38	37.03 ±11.1	37.82 ±11.74	0.3614
Background scale	2.21 ±2.63	2.28 ±2.55	2.13 ±2.73	0.4602

Regarding the severity of dental fear, there was no statistically significant difference between the two countries ($p \leq 0.05$, chi square test). 189 subjects (46.66%) from the sample from Romania presented low dental fear (DFS score ≤ 33), 173 subjects (42.61%) had moderate dental fear (DFS=34-58), while 44 subjects (10.84%) were prone to dental phobia (DFS 59). In case of the sample from Hungary, 156 subjects (50.81%) presented low, 130 subjects (42.35%), moderate and only 21 subjects (6.84%) severe dental fear levels.

Moreover, analyzing from the perspective of gender, females from the two samples did not show any mathematically significant difference in none of the questionnaires. Males from the Hungary presented statistically significantly higher scores only in case of DBS ($p \leq 0.05$, independent t test) (Table 2).

Table 2. *Dental fear and anxiety scores of Romanian children from Romania and Hungary aged 11-18 years from the viewpoint of gender*

FEMALES	Whole Sample (n=393)	Romanian (n=236)	Hungarian (n=157)	p (≤ 0.05)
Age	15.03 ±2.32	15.88 ±2.07	13.76 ±2.09	
DFS	40.11 ±14.07	40.28 ±13.66	39.85 ±14.71	0.7635
DBS	36.41 ±11.16	36.9 ±11.02	35.66 ±11.36	0.2813
Background scale	2.28 ±2.55	2.4 ±3.22	2.09 ±0.8	0.2366
MALES	Whole Sample (n=320)	Romanian (n=170)	Hungarian (n=150)	p (≤ 0.05)
Age	14.51 ±2.3	15.44 ±2.04	13.45 ±2.12	
DFS	34.99 ±13.97	35.74 ±15.43	34.15 ±12.09	0.3088
DBS	38.56 ±11.56	37.22 ±11.25	40.08 ±11.75	0.0268
Background scale	2.13 ±2.73	1.96 ±0.8	2.33 ±3.9	0.2224

Table 3 presents the scores given to each question of the DFS from the viewpoint of domicile. The Cronbach alpha value for DFS was 0.935, which is a case in point to the subjects' good collaboration. It was observed, that the questions referring to the injection were scored the highest and those about the drill were somewhat lower but still high. Besides these, the judgment of dentistry as a whole (20th question) was still high, but it did not reach the level of the most fearful part

of the treatment, which was related to receiving an injection. We observed statistically significant differences from the viewpoint of residence between questions no. 2, 3, 4, 6, 9-13 and 20, respectively (independent t-test, $p < 0.05$).

Table 3. DFS question scores

DFS	Whole sample (n=713)	Romania (n=406)	Hungary (n=307)	p (≤ 0.05)
Avoiding dental care				
1. unable to get an appointment	1.61 \pm 1.02	1.67 \pm 1.12	1.54 \pm 0.86	0.0912
2. unable to go to the appointment	1.25 \pm 0.73	1.33 \pm 0.82	1.15 \pm 0.59	0.0015
Autonomic nervous system activity during treatment				
3. muscle tension	2.1 \pm 1.04	2.41 \pm 1.11	1.69 \pm 0.77	<0.0001
4. quick respiration	1.78 \pm 1.05	1.96 \pm 1.13	1.55 \pm 0.88	<0.0001
5. sweating	1.67 \pm 0.95	1.64 \pm 0.95	1.72 \pm 0.96	0.2755
6. nausea	1.32 \pm 0.74	1.29 \pm 0.74	1.36 \pm 0.75	0.2288
7. quick pulse	2.06 \pm 1.14	2.27 \pm 1.22	1.78 \pm 0.96	<0.0001
Fears caused by situations and stimulus				
8. asking for an appointment	1.63 \pm 0.97	1.61 \pm 0.93	1.66 \pm 1.03	0.4452
9. approaching the dental office	1.77 \pm 1.05	1.77 \pm 1.04	1.76 \pm 1.06	0.8235
10. sitting in the waiting room	1.78 \pm 1	1.71 \pm 0.98	1.87 \pm 1.03	0.0371
11. sitting in the dental unit	2.01 \pm 1.1	1.92 \pm 1.07	2.11 \pm 1.14	0.0224
12. smells of the dental office	1.68 \pm 1.03	1.62 \pm 1.04	1.77 \pm 1	0.0522
13. seeing the dentist	1.71 \pm 0.96	1.61 \pm 0.92	1.85 \pm 1	0.0008
14. seeing the injection	2.65 \pm 1.3	2.71 \pm 1.32	2.58 \pm 1.26	0.1946
15. feeling the injection	2.59 \pm 1.26	2.64 \pm 1.27	2.52 \pm 1.25	0.1788
16. seeing the drill	2.3 \pm 1.26	2.22 \pm 1.23	2.41 \pm 1.28	0.0466
17. hearing the drill	2.07 \pm 1.17	2.05 \pm 1.14	2.1 \pm 1.2	0.5643
18. feeling the vibration caused by the drill	2.18 \pm 1.23	2.26 \pm 1.24	2.09 \pm 1.21	0.0644
19. scaling	1.51 \pm 0.95	1.47 \pm 0.81	1.55 \pm 1.11	0.3034
20. general fear towards dentistry	2.15 \pm 1.12	2.24 \pm 1.1	2.03 \pm 1.15	0.0161

Cronbach alpha was 0.848 for DBS. In *Table 4*, scores given to each question of the DBS dissociated by domicile can be seen. From the viewpoint of domicile, questions number 2, 7 and 14 showed mathematically significant differences (independent t-test, $p < 0.05$). On the one hand subjects from Romania objected mostly towards the lack of time dentists deal with when treating patients. On the other hand, subject from Hungary reported fear of posing questions and sentiment of guilt caused by dentists.

Table 4. DBS question scores

DBS	Whole sample (n=713)	Romania (n=406)	Hungary (n=307)	p (≤0.05)
1. I believe dentists do not like it when patients ask questions.	2.68 ±1.14	2.62 ±1.15	2.75 ±1.13	0.1432
2. Dentists help but they always seem busy, which makes me feel guilty.	3.09 ±1.27	3.26 ±1.24	2.87 ±1.28	<0.0001
3. Dentists do not give sufficient explanation about what they are doing when working on my teeth.	2.47 ±1.31	2.46 ±1.25	2.49 ±1.4	0.759
4. I feel that dentists do not listen to what I am saying.	2.02 ±1.17	1.99 ±1.12	2.06 ±1.23	0.4274
5. I am concerned that the dentist will do what he wants and not really listen to me.	2.13 ±1.31	2.16 ±1.32	2.09 ±1.3	0.5195
6. I am concerned that the dentist will do what he wants and not really listen to me.	2.62 ±1.39	2.54 ±1.4	2.73 ±1.37	0.0654
7. Dental professionals say things to make me feel guilty about the way I care for my teeth.	2.22 ±1.22	2.03 ±1.13	2.47 ±1.29	<0.0001
8. Dentists often say things that make me feel ridiculous.	2.3 ±1.34	2.31 ±1.34	2.27 ±1.33	0.6981
9. I feel I cannot trust dentists' words about my anxiety.	2.49 ±1.39	2.49 ±1.41	2.49 ±1.36	0.9883
10. I feel concerned that dentists will not take my worries (fears) about dentistry seriously.	1.95 ±1.25	2.01 ±1.27	1.87 ±1.22	0.1372
11. I am concerned that dentists might not be skilled enough to deal with my fears or dental problems.	2.85 ±1.43	2.87 ±1.46	2.84 ±1.39	0.7995
12. If I were to indicate that it hurts, I think that the dentist would be reluctant to stop and try to correct the problem.	2.45 ±1.42	2.39 ±1.41	2.54 ±1.44	0.1685
13. When I am in the chair I do not feel like I can stop the appointment for a rest if I feel the need.	3.06 ±1.53	3.1 ±1.51	3.01 ±1.55	0.4013
14. I feel uncomfortable asking questions.	2.86 ±1.54	2.65 ±1.53	3.14 ±1.53	<0.0001
15. Being overwhelmed by the amount of work needed (all the bad news) could be enough to keep me from beginning or completing treatment.	2.2 ±1.36	2.18 ±1.39	2.22 ±1.33	0.751

The scores of the Background Scale were very similar in the two samples (see Table 1). A score of 2.28 was attained for the sample from Romania and 2.13 for the one from Hungary. They indicate a low level of dental fear originating from the subjects' childhood environment.

Figures 1, 2 and 3 present the mean scores of the three questionnaires in different age groups in the two countries. From the viewpoint of age, in the sample from Romania, the 11-year-old group presented the lowest scores for every questionnaire. The DFS and Background Scale were topped by the 14-year-old group, while the 16-year-olds showed the highest scores for DBS. In the same time, in the subjects from Hungary, the 11-year-olds were once again the least fearful. The climax of dental fear emerged in the 12-year-old group, from where the scores gradually decreased. In addition to this, DBS scores showed that the 12-year-olds had the most problems with dentists, while the 14-year-olds appreciated their environment to be the most afraid of dental treatments. Age is a significant factor from a mathematical point of view in case DFS and DBS in both of the samples (one-way ANOVA, $p < 0.05$).

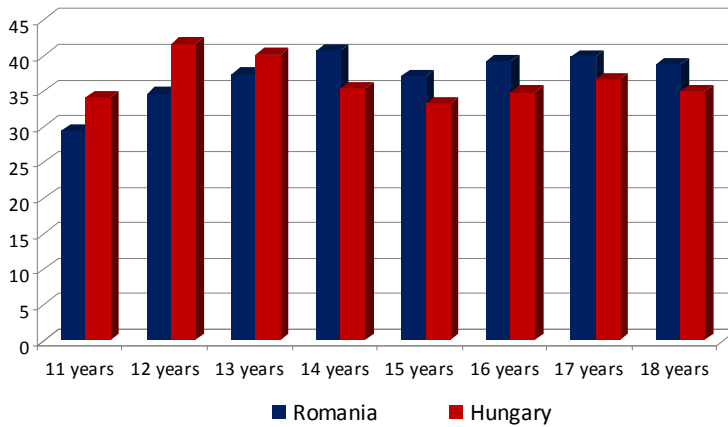


Figure 1. DFS scores for different age groups

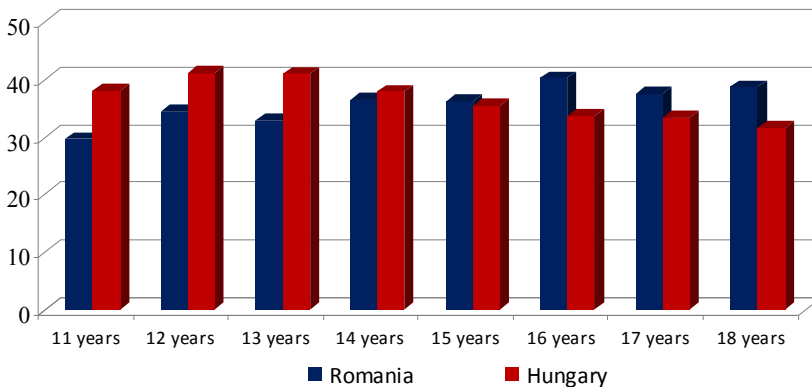


Figure 2. DBS scores for different age groups

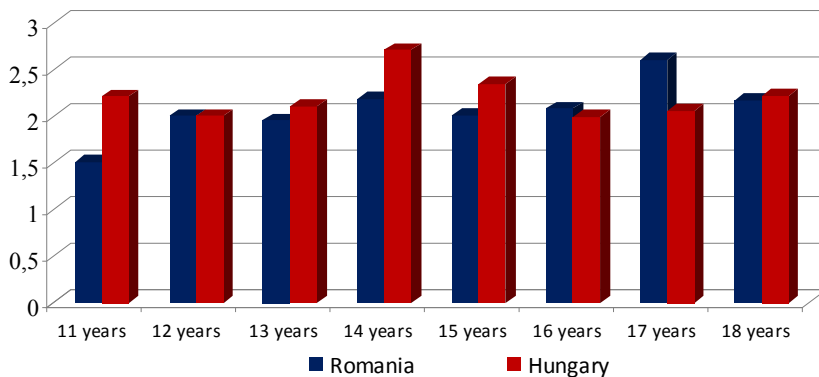


Figure 3. Background Scale scores for different age groups

Discussions

The prevalence of DFA in children varies globally. Worldwide studies have shown that between 3% and 43% of children exhibit dental anxiety (Folayan *et al.*, 2004). In northern Europe it has been reported between 3% and 21%. The maximum frequency was reported to be around 11 years of age, with a decline towards adolescence (Răducanu *et al.*, 2009; Chapman & Kirby, 1999), as children may develop methods to control their anxiety as they grow older (Udoye *et al.*, 2005; Klinberg & Broberg, 1998). In terms of gender, females present in most of the cases, higher levels of anxiety (Chellappah *et al.*, 2006).

The mean score of DFS indicates the presence of a slightly moderate dental fear in this sample. Only 10.84% of the children from Romania and 6.84% of the children from Hungary suffered from phobia, while the rest of the subjects presented low or moderate levels of fear in 50–50 percent. Moreover, this DFS score (37.81) is lower than the ones found in other evaluations of children from Romania and Hungary. Markovics *et al.* measured 50.6 DFS score on a sample with the same age (15.2 ± 2.0 years) (Markovics *et al.*, 2005), while Mărginean and Filimon found 40.57 for DFS in a young adult population (Mărginean & Filimon, 2011). In the same time, Hungarian children's scores were very similar to ours (aged 8–15 years DFS:40.4 (Fábián *et al.*, 2003), aged 14–18 years DFS:40.6 (Fejérdy *et al.*, 2003).

Gótai *et al.* (Gótai *et al.*, 2012) have evaluated the dental fear and anxiety of Hungarian population living in Hungary and Slovakia using similar methods to ours. They found lower scores in Hungarians living in Slovakia when compared

in Hungary, but the results were statistically significant only in the case of DFS (DFS: 42,04 for Hungary and 36,17 for Slovakia, DBS: 33 for Hungary and 32,58, Background Scale: 3,03 for Hungary and 2,46 for Slovakia). There is no mathematically significant difference between these results and ours.

Another similar study was performed by Markovics *et al.* (2005). It was with regard to Hungarian children residing in Romania, close to the Hungarian border. This study is very similar to ours by means of methodology and sample. Nevertheless, their findings indicate a much more severe dental fear than the one found in our samples (DFS: 50,6 and DBS: 44,9). The detailed analysis of the questions of DFS and DBS highlights aspects of dental treatment, which cause the most problems to patients. Consistent with the literature, questions referring to injection and drilling scored the highest in this case as well (Gótai *et al.*, 2012; Cerghizan, 2009). The subjects from Romania presented more autonomic nervous system activity than their fellows from Hungary, whereas the latter ones claimed higher levels of fears by situations and stimuli. Similarly to Markovics *et al.*'s results, our subjects from Romania also claimed lack of time (Markovics *et al.*, 2005). The biggest problem for our subjects from Hungary were, difficulties in communication, especially with regards to the fear of posing questions to their dentists. This observation resembles the one made by Gótai *et al.* (Gótai *et al.*, 2012).

Conclusions

The findings of the present study suggest that dental fear and anxiety in Romanian children living as a minority in Hungary is similar to the results of their Romanian fellow counterpart's residing in Romania. Besides, the scores measured indicate the presence of a moderate dental fear which is consistent with international findings. Moreover, an improvement can be observed, as the scores of dental fear show a decreasing tendency in comparison with other regional surveys. Childhood environment did not have any influence on the child's dental fear in neither of the countries. The differences found between the two samples were spread among the details of the procedures. On the one hand, autonomic nervous system activity was more frequent in the sample from Romania, and, on the other hand, children from Hungary were more afraid of situations and stimuli. In addition to this, dental treatment performed in Romania under time pressure was felt to be the major problem, while in Hungary, behavioural aspects of the patient-practitioner relationship were objected. Therefore, it is shown in this case, that residing in a foreign country does not affect dental fear and anxiety in a significant way.

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