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Emotional Problems and Specific Irrational Beliefs of Children and Adolescents Suffering from Headaches

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Abstract

In paediatric outpatient clinics, patients with headaches make up for more than a third of the total number of examinations. Studies show that over 70% of school children suffer from headaches at least once a year and that development of headaches can favour many organic, environmental and psychogenic factors. Irrational beliefs play the primary role in the development of many emotional difficulties. Due to irrational beliefs, some children and adolescents continually distort the meaning of events in a negative direction. Catastrophizing plays a crucial role in the development and maintenance of headaches. It leads to over-estimation, rumination, helplessness and greater focus on pain.

Objective: The objectives of this study were to determine whether there is any difference in irrational beliefs and emotional impairment between the clinical and control group of children and adolescents, with the purpose of gaining knowledge for future planning of cognitive-behavioural treatment.

Methods: The research was conducted at the Department of Paediatrics, Clinical Hospital Centre Osijek, among the inpatients and outpatients with headache, as well as in two primary and secondary schools in Osijek. Children and adolescents aged between 10 and 18 were examined (N = 172). The research included the Headache Questi-

onnaire, Irrational Beliefs Test and Beck Youth Inventories- second edition (BYI-II).
Results: The results indicate a significant difference in the level of emotional impairment between the control and clinical group of children and adolescents, with children from the clinical group showing a higher level of emotional impairment, as well as a greater inclination to irrational beliefs.
Conclusion: Children in the clinical group exhibit significantly more emotional disturbances. In addition, higher level of some irrational beliefs has been observed in the clinical group when compared to the control group of schoolchildren. Results will be used to plan cognitive behavioural treatment for children and adolescents

Keywords: headaches, irrational beliefs, emotional impairment, children and adolescents

Introduction

Headache is considered one of the most frequent health concerns in children and adolescents. In the past several decades, it appears that prevalence rates have increased. Today, 66 % - 71% of 12- to 15-year-olds suffer from headaches at least once every three months and 33% - 40% have at least one per week (Straube, Heinen, Ebinger & von Kries, 2013). This leads to hundreds of school absences every month and poorer academic performance (Drake & Ginsburg, 2012). Furthermore, headaches interfere with other daily activities. They are associated with higher rates of social withdrawal, anxiety depressive symptoms, sleep disturbance, excessive daytime sleepiness, and more frequent family conflict (Law, Beals-Erickson, Noel, Claar & Palermo, 2015). According to Bulloch & Tenebein (2000; as cited in Drake & Ginsburg, 2012), paediatric headaches create considerable strain for the healthcare system and represent the third most common cause for children being referred to emergency departments.

Left untreated, paediatric headaches can persist into adulthood. Therefore, effective treatments in childhood are necessary to minimize the negative effect of this condition across one's lifetime.

The genesis, exacerbation and maintenance of headaches are explained by various theories. The biopsychosocial model of chronic pain explains the complex interaction among biological (e.g. genetics), psychological and social/environmental factors in paediatric headache. The psychosocial aspects can be broken down into the categories of behavioural, cognitive and affective influences. The experience of pain is influenced by a variety of cognitive factors such as beliefs, expectations, attention, coping styles and memories about pain. The meaning attributed to pain is individual. The transactional stress model (Lazarus & Folkman, 1984, as cited in Johari-Fard, Goli & Boroumand, 2013) discerns between the primary appraisal (evaluating pain significance as it being benign, threatening or irrelevant) and secondary appraisal (evaluating pain controllability and one's coping resources). Person's affective and behavioural response to pain depends on individual appraisal and beliefs. According to this model, when you see the pain as a threat, you view it as something that will cause future harm, such as reduced efficiency in social and academic field. When you see the pain as benign or irrelevant, you devolop a positive stress response and mobilization of physical and psychological activity and involvement.

Irrational beliefs, key notion in cognitive theory and therapy, have also been taken into consideration in this study. Ellis's Rational-Emotive-Behaviour theory is a well-known cognitive theory which identifies irrational beliefs as the main element of human being's mental and behavioural disorders and distress. Studying the impact of irrational beliefs on individuals' mental health, Ellis & Harper (1970) suggested that the presence of irrational beliefs may result in anxiety and depression disorders in the long run (cited in Molavi, Mikaeili & Ghaffari, 2017).

Catastrophizing, an irrational belief that predicts a negative, catastrophic outcome, is widely linked to chronic pain and often present in headache patients. If a headache is seen as harmful and believed to correlate with actual or potential ailment, one may perceive it as more severe, which may trigger escape or avoidance behaviour. Although findings have consistently shown a correlation between pain and catastrophizing, research in this field has continued without a guiding theoretical framework (Johari-Fard et al, 2013).

Many authors have found that youth suffering from chronic headaches exhibit high rates of comorbid psychopathology but the exact nature of this relationship remains unclear. Liakopoulous-Kairis study (2002; as cited in Drake & Ginsburg, 2012) suggests the presence of a comorbid psychiatric disorder in 84% of youth with headaches, most often anxiety (35%) and depressive (23%) disorders. Depressed and anxious persons consistently distort the connotation of events to understand their experiences as negative and self-defeating (Lefebvre, 1981, as cited in Johari-Fard et al, 2013).

In this research, we made efforts to determine whether there is any difference in irrational beliefs

and emotional impairment between the clinical and control group of children and adolescents, with the purpose of gaining knowledge for future planning of cognitive-behavioural treatment.

Participants and Methods

The research included 74 young patients with the ICD-10 diagnosis of headache (both inpatients and outpatients) and 98 healthy control subjects. The patients were recruited between December 2016 and December 2017 at the Department of Paediatrics, University Hospital Centre Osijek, Croatia. The healthy control subjects were recruited in April 2017, in two elementary schools and two high schools. This was a purposive sample matched to the clinical sample by age and gender. We contacted the schools in close proximity to the Hospital and asked them for permission to recruit participants. Once we obtained the permission, we recruited participants from classes that were matched by age. All the participants who consented to join the research were recruited in the control sample.

The entire sample consisted of 69.2% female and 30.8% male participants, in the 10-18 age range (M=14.32; sd=2.39). Exclusion factors in this research were as follows: (1) the youths had a co-morbid chronic medical condition such as cancer, diabetes or sickle cell disease; (2) the youths had a developmental disability as reported by their parents or (3) the parent or youngster was a non-Croatian speaker. The study was officially approved by the local Ethical Committee of the institution in which the study was conducted. After the aims and procedures of the study were explained to the children, adolescents and their parents, the parents were asked to sign a written informed consent for their children's participation. Their sociodemographic variables were recorded (age, sex, grade, school achievement, place of residence). Researchers then asked children and adolescents to complete the battery of questionnaires about their experiences with headaches and emotional problems. The battery entailed the Headache Questionnaire, Irrational Beliefs Test and Beck Youth Inventories- second edition (BYI-II).

Measures

Headache Questionnaire, elaborated by one of the investigators for the purpose of this study, was made up of 11 items with multiple choice answers, related to the occurrence (e.g. How often do you experience headaches?), duration and localization of headaches (e.g. Where do you feel the pain during headache?), precipitating factors, family heredity, accompanying symptoms, absence from school (e.g. Do you miss school because of headaches?) and headache treatment.

Irrational Beliefs Test is a questionnaire designed for research purposes and includes 44 items. This questionnaire measures different types of irrational beliefs (mental filtering, jumping to conclusions, personalizing, catastrophizing, polarized thinking, making ''must'' or ''should'' statements, over-generalizing, labelling, emotional reasoning and magnification and minimization) based on the five-point scale (1=strongly disagree to 5=strongly agree). The items were concieved based on the authors' clinical experience regarding what kind of irrational beliefs occur in patients suffering from headaches. Examples of items are: The headache will never stop; I am weird; I am incapable, etc. Internal consistency was measured with Chronbach's Alpha and it was .93 with all 44 items. As for the particular subscales, Cronbach's Alpha was .48 for mental filtering, .65 for jumping to conclusions, .43 for personalizing, .84 for catastrophizing, .76 for polarized thinking, .73 for making ''must'' or ''should'' statements, .68 for over-generalizing, .74 for labelling, .81 for emotional reasoning and .58 for magnification and minimization.

Beck Youth Inventories, Second Edition (BYI-II), evaluate emotional and social impairment in children and adolescents. They are a set of five self-report inventories intended for assessing symptoms of

depression, anxiety, anger, disruptive behaviour and self-concept. Each inventory consists of 20 statements pertaining to feelings, thoughts and behaviours related to emotional and social impairment, which youths rate in terms of how often each statement has been true for them. They are standardised for youths aged 7 to 18 in Croatia (Beck J.S., Beck A., Jolly & Steer, 2011).

Results

Sociodemographic factors of the sample can be seen in Table 1.

Table 1 *Sociodemographic factors of the sample*

	Headache group	Healthy control group	Total
Gender			
Female	58 (78.4)	61 (62.2)	119 (69.2)
Male	16 (21.6)	37 (37.8)	53 (30.8)
Age (years) (Mean±SD)	15.01 (2.18)	13.80 (2.42)	14.32 (2.39)
Place of residence			
Urban are	26 (35.1)	64 (65.3)	90 (52.3)
Rural area	48 (64.9)	34 (34.7)	82 (47.7)
Family circumstances			
Complete family	56 (75.7)	87 (88.8)	143 (83.1)
Incomplete family	18 (24.3)	11 (11.2)	29 (16.9)
School			
Elementary school	27 (36.5)	51 (52.0)	78 (45.3)
High school	47 (63.5)	47 (48.0)	94 (54.7)
School achievement			
Good	2 (2.0)	5 (5.0)	7 (4.1)
Very good	51 (68.9)	50 (51.0)	101 (58.7)
Excellent	21 (28.4)	43 (43.9)	64 (37.2)

Descriptive statistics and reliability test for main variables in clinical and control group can be seen in Table2.

Table 2 *Descriptive statistics and reliability for main variables in headache and healthy control group*

	Headache group							Healthy control group						
	SC	A	D	C	OG	L	ER	SC	A	D	C	OG	L	ER
M	39.07	21.23	13.22	9.62	8.41	8.81	9.14	38.93	15.51	6.67	7.95	7.56	8.10	8.14
SD	7.19	8.92	9.27	4.26	3.22	3.59	3.49	8.48	9.09	8.05	3.96	3.02	3.78	3.85
Median	39.50	21.00	12.00	8.00	8.00	9.00	9.00	39.00	13.00	8.00	6.00	7.00	7.00	7.00
Mode	34	15	12	6	6	9	5	39	12	5	6	6	5	5
Min-max	20-53	3-42	0-48	5-20	0-17	0-23	0-18	22-59	0-47	0-42	6-25	4-18	5-21	5-23
Skewnes	-.474	.105	.949	1.047	.206	1.099	.311	-.093	.881	1.262	2.888	1.252	1.745	1.765
Kutosis	.300	-.469	1.582	-.209	-.232	2.830	.069	-.594	.716	1.925	8.951	1.629	2.741	3.323
Cronbach α	.83	.88	.94	.84	.65	.67	.76	.87	.89	.92	.92	.66	.79	.85

Legend: SC-Self concept; A- Anxiety; D- Depression; C- Catastrophizing; OG- Over-generalizing; L-Labelling; ER- Emotional Reasoning

Considering the clinical factors of the headache group, 52.7% of participants started having headaches several years before and only 13.5% of them started having them in the previous year. Most participants (93.2%) experienced their last headache sometime in the previous week. Most participants usually have headaches once a week (41.9%), followed by those who have them several times a week (37.8%), while only a few respondents reported having them once a month or more rarely. Headaches usually last for a few hours (63.5%). Most common form of headache in our sample was temporal headache (32.4%). Regarding the family heredity, 86.5% of participants with headaches reported they had no family members suffering from headaches (Table 3.).

Table 3 *Clinical factors of the headache group*

	Number of participants (%)
When did headaches start?	
Within the last year	10 (13.5)
In the last year or two	25 (33.8)
Several years ago	39 (52.7)
When did the last headache occur?	
Last week	69 (93.2)
Month or more ago	5 (6.8)
How often do headaches occur?	
Daily	11 (14.9)
Once a week	31 (41.9)
Several times a week	28 (37.8)
Once a month or less often	4 (5.4)

How long do headaches last?	
Several minutes	16 (21.6)
A few hours	47 (63.5)
Whole day	11 (14.9)
Headache location	
Frontal	21 (28.4)
Parietal	11 (14.9)
Temporal	24 (32.4)
Occipital	2 (2.7)
Affecting whole head	16 (21.6)
Family heredity	
Existent	10 (13.5)
Non-existent	64 (86.5)

Among the most common precipitating factors are stress/fatigue, weather fluctuation, too much/ too little sleep, noise, physical activity and hunger. Among the symptoms accompanying headaches, participants usually feel dizziness, sensitivity to sound/ light, difficulty concentrating and nausea or vomiting. There are methods and treatments that can alleviate headache. 64.9% of participants reported that sleeping reduces their headache, 31.1% uses head massage, 27% find being in a dark and quiet room helpful and only 20.3% use medications.

This research also examined the irrational belief patterns of young patients with the ICD-10 diagnosis of headache and of healthy control subjects. Table 4 shows the most common irrational beliefs and differences between the two groups. The headache group had a statistically higher tendency of catastrophizing, over generalizing, labelling and emotional reasoning.

Table 4 *Irrational beliefs in clinical and non-clinical group*

Irrational Beliefs	Headache group (%)	Healthy control group (%)	*P**
Mental Filtering	4 (2-9)	4 (2-9)	.22
Jumping to Conclusions	9 (4-16)	8 (4-18)	.23
Personalizin	8 (3-12)	7 (3-14)	.49
Catastrophizing	8 (5-20)	6 (6-26)	**.00**
Polarized Thinking	8 (6-22)	8 (6-23)	.94
Making ''must'' or ''should'' statements	15 (0-25)	14 (5-24)	.10
Over-generalizing	8 (0-17)	7 (4-18)	**.04**
Labelling	9 (0-23)	7 (5-21)	**.02**
Emotional Reasoning	9 (0-18)	7 (5-23)	**.01**
Magnification and minimization	9 (0-17)	8 (4-20)	.06

*Mann Whitney U test

Analysis of differences between the two groups suggests that in group of children and adolescents with headaches, it is more likely for high school students to experience anxiety than elementary school students ($t(72) = -3.096$; $p = .00$). There is no difference in the level of self-concept, depression and irrational beliefs between elementary and high school students in the clinical group. Analysis of differences in the control group suggests that high school students are more likely to experience anxiety ($t(96) = -3.292$; $p = .00$) and depression (Mann-Whitney test z = -2.643; $p = .00$) than students in elementary school and they also showed statistically higher tendency to over-generalize (Mann-Whitney test z = -2.356; $p = .01$), catastrophize (Mann-Whitney test z = -2.448; $p = .01$), label (Mann-Whitney test z = -3.279; $p = .00$) and use emotional reasoning (Mann-Whitney test z = -2.392; $p = .01$). The analysis also suggests that elementary school students in the control group have a higher level of self-concept than high school students ($t(96) = 2.400$; $p = .01$).

Table 5 *Differences in the level of self-concept, anxiety and depression and four irrational beliefs in relation to school*

	Headache group			Healthy control group		
	Elementary school	High school	*P**	Elementary school	High school	*P**
Self –concept	41.07 (7.08)	37.91 (7.08)	.07	40.84 (9.01)	36.85 (7.42)	.01
Anxiety	17.22 (8.50)	23.53 (8.39)	.00	12.75 (7.34)	18.51 (9.89)	.00
Depression	11 (1-28)	13 (0-48)	.10[U]	6 (0-27)	10 (0-42)	.00[U]
Catastrophizing	8 (5-19)	8 (6-20)	.33[U]	6 (6-21)	7 (6-26)	.01[U]
Over-generalizing	8 (0-14)	8 (4-17)	.59[U]	6 (4-16)	8 (4-18)	.01[U]
Labelling	8 (0-15)	9 (5-23)	.05[U]	6 (5-20)	8 (5-21)	.00[U]
Emotional Reasoning	9 (0-16)	9 (5-18)	.09[U]	6 (5-23)	7 (5-22)	.01[U]

***** Student *T* test; [U] Mann Whitney U test

The analysis of school-related differences suggests that the clinical group of elementary school students has a higher level of anxiety ($t(76) = 2.312$; $p = .02$) and depression (Mann-Whitney test z = -1.979; $p = .04$) and has a higher tendency to catastrophize (Mann-Whitney test z = -4.045; $p = .00$) and use emotional reasoning (Mann-Whitney test z = -2.900; $p = .00$), then elementary school students in the control group. Anxiety is more likely to be experienced by the clinical group of high school students than the ones in the control group ($t(92) = 2.653$; $p = .00$), but there is no difference in the level of self-concept, depression and irrational beliefs when comparing the clinical and the control group of high school students.

Table 6 *Differences in the level of self-concept, anxiety and depression and four irrational beliefs in relation to group*

	Elementary school			High school		
	Headache group	Healthy control group	*p*	Headache group	Healthy control group	*p*
Self –concept	41.07 (7.08)	40.84 (9.01)	.90	37.91 (7.08)	36.85 (7.42)	48
Anxiety	17.22 (8.50)	12.75 (7.34)	.02	23.53 (8.39)	18.51 (9.89)	.00
Depression	11 (1-28)	6 (0-27)	.04[U]	13 (0-48)	10 (0-42)	.15[U]

Catastrophizing	8 (5-19)	6 (6-21)	.00 U	8 (6-20)	7 (6-26)	.31 U
Over-generalizing	8 (0-14)	6 (4-16)	.10 U	8 (4-17)	8 (4-18)	.47 U
Labelling	8 (0-15)	6 (5-20)	.07 U	9 (5-23)	8 (5-21)	.45 U
Emotional Reasoning	9 (0-16)	6 (5-23)	.00 U	9 (5-18)	7 (5-22)	.62 U

***** Student T test; U Mann Whitney U test

Discussion

Sociodemographic characteristics of the sample suggest a 2:1 ratio with girls prevailing, which is in line with reports from literature (Kirschneck, Römer, Proff & Lippold, 2013). Launer, Terwindt and Ferari (1999) demonstrated that the prevalence of headache is considerably greater in women and not related to socioeconomic status. Barea, Tannhauser and Rotta (1996) conducted an epidemiologic study of headache among children and adolescents in Brazil, and their research showed that the prevalence of tension-type headache was significantly higher in the female group.

Most of the participants in the headache group were suffering from headaches for several years. In this group, we find significantly more secondary school students than elementary school ones, which is in accordance with previous research on a sample of children and adolescents. Certain international publications showed an increase of the lifetime prevalence of headache from 47.2% in children to 69.5% in adolescents (Aromaa, Rautava, Helenius & Sillanpää, 1998; Gallelli et al, 2005; Ozge, Sasmaz, Cakmak, Kaleagasi & Siva, 2010).

Regarding headache duration, the findings of the present study are consistent with findings of the study conducted by Foiadelli et al (2018) on Italian adolescents aged 11–16. The present study showed that mean duration of a headache episode was either a few hours (63.5%), several minutes (21.6%) or the whole day (14.9%). Although the authors used a different methodology, similar results were obtained on the Italian sample. In that research, a headache episode lasted on average less than 30 min in 32.9% of participants, 1 hour in 28.1% of them, 2 hours in 19.3% and several hours in 19.5%.

Family heredity in headaches has been established in numerous studies (Foiadelli et al, 2018; Kröner-Herwig, Heinrich & Morris, 2007; Isensee, Fernandez Castelao & Kröner-Herwig, 2016), but that is not the case in the present study. Our study showed that only 13.5% of paediatric headaches were associated with parental headache history. This difference in findings can probably be attributed to different geographical and methodological factors.

With regard to precipitating factors, participants were able to identify the factors leading to headaches. Precipitants were selected by the participants from a list which comprised the main paediatric headache-related precipitants reported in literature (Goto et al, 2017; Taheri, 2017; Wang et al, 2013; Zebenholzer et al, 2016). The reported precipitants, in order of their relevance, were as follows: stress/ fatigue (62.2%), weather fluctuation (45.9%), too much/too little sleep (40.5%), loud noise (35.1%), physical activity (33.8%), hunger (29.7%), menstruation (23%), strong smells (21.6%), using PC/laptop for a long time (20.3%), bright light (18.9%), smoke (18.9%) and certain foods (1.4%) (Fig. 1.). Review of earlier research showed stress, weather fluctuations, hunger and sleep deprivation as the precipitants most frequently mentioned (Kelman, 2007; Robbins, 1994; Rasmussen, 1993), although factors such as menstruation, fatigue, food and bright light are also regularly cited with different prevalence proportions (Fukui, Gonçalves & Strabelli, 2008; Haque, Rahman & Hoque, 2012; Mollaoglu, 2013), possibly because of different socio-cultural aspects of the samples used.

Patients with different types of headache usually complain of various accompanying symptoms.

Those most commonly associated with headache are nausea, vomiting, dizziness and visual disturbances or blurred vision (Weisleder, 2001), which is also confirmed in the present study (45.9% participants in the headache group reported dizziness; 39.2% of them reported sensitivity to sound/light; 37.8% have difficulty concentrating; 29.7% reported nausea or vomiting and 13.5% reported blurred vision). In alleviating headache pain, our participants in the headache group most frequently reported non-pharmacologic measures they find beneficial in alleviating or preventing headaches, including getting an adequate amount of sleep (64.9%), head massage (31.1%) and being in a dark/quiet room (27%). Just 20.3% of participants reported use of medications. The finding on use of medications differs significantly from the results of previous studies, both in Croatia and abroad. In the Italian sample of adolescents, more than two thirds of adolescents (69.15%) reported use of medications for headache control (Foiadelli et al, 2018). In the Croatian epidemiological study of clinical characteristics and prevalence of headache in adolescents, Vuković Cvetković et al. (2014) highlight that almost one third of adolescents takes medications for headache relief, while one fifth has never taken any sort of medication for headache. Overall, girls are more prone to taking medications and they also take more medications per month.

Rahnamay et al. (2013; cited in Molavi et al., 2017) suggested that irrational beliefs are associated with quality of life of patients with migraine. Furthermore, according to Peinzen et al (2005), irrational beliefs play a significant role in the relationship between stress, coping and headaches. In our study, results related to irrational beliefs suggest higher tendency to catastrophize, over-generalize, label and use emotional reasoning within some groups. Specifically, the clinical group of elementary school students has a higher tendency to catastrophize and use emotional reasoning, then elementary school students in the control group. As regards the high school participants, we can also notice a higher levels of some irrational beliefs in the headache group, but that differences were not significant. According to Sullivan, Bishop and Pivik (1995), catastrophic thinking is a significant factor in the domain of pain. In their study, catastrophizers reported significantly more pain-related thoughts, grater emotional distress and intensity of pain than non-catastrophizers. We must not neglect the low internal consistency of certain subscales of the irrational belief questionnaire, which implies the necessity of revising, rejecting certain items, or increasing the number of items for certain subscales. Given that subscales with low consistency were not used in subsequent analyses, they were not given much attention in this study.

Participants with headaches reported higher levels of anxiety compared to the healthy control group, both in elementary and high school. The level of depression was statistically higher in the headache group, but only for elementary school participants. As regards the high school participants, we can also notice a higher level of depression in the headache group, but this difference was not significant.

Liakopoulus-Kairis et al. (2002; cited in Drake & Ginsburg, 2012) found that 84% of adolescents suffering from headaches also had a psychiatric disorder (mostly anxiety and depressive disorder). Other researchers found a similar association between psychiatric disorders and patients with headaches (Breslau & Andreski, 1995; Peinzen et al., 2005). The findings of this study regarding the differences in the level of anxiety and depression related to school indicate that high school students are more anxious and depressed than elementary school students, both in the clinical and the control group. Vulić-Prtorić (2002) demonstrated that high school students (60.4%) are more likely to experience intense fear than elementary school students (56.2%) and Jokić-Begić, Lauri Korajlija & Jurin (2007) study results indicated that intensity of anxiety and depression symptoms increases with child's age. When it comes to self-concept, the results suggest that elementary school students have a higher level of self-concept than students in high school. Scott & Santos de Barona (2011) investigated a similar concept in their longitudinal study and concluded that self-concept ratings remain stable when comparing elementary and high school students if there is no physical transition or any social network changes in the period between elementary and high school.

Furthermore, elementary school students in the control group showed lower tendency to over-gen-

eralize, label and use emotional reasoning compared to high school students. A study in a Nigerian secondary school (Ndika et al., 2009) examined irrational beliefs in relation to age differences and demonstrated that older adolescents agreed less with irrational ideas than younger adolescents. In addition, one Slovakian study (Kordacova, 1998) found significant differences between the youth and adults in the same direction.

Limitations of the study

This study should be evaluated with certain important limitations in mind. Firstly, the sample size is relatively small, due to which the findings of the study may not be generalizable. Secondly, the data were collected only in one hospital, which also may cause the generalizability of the present results to be limited. Thirdly, the use of cross-sectional design was limiting in terms of making causal inferences. Furthermore, self-rated scales were used for evaluating emotional symptoms instead of objective assessment. We also cannot ignore the potential impact of other factors which were not investigated in this study (e.g. personality traits, parental perception about the headache).

Conclusion

This study examined the difference in irrational beliefs and emotional impairments between the clinical and control group of children and adolescents. Following an analysis, it was concluded that there is a significant difference in the level of anxiety between the control and the clinical group of children and adolescents, both in elementary and high school participants. Elementary school participants from the clinical group showed a higher level of anxiety and depression, as well as greater inclination to some irrational beliefs. These results may prompt the devising of prevention and treatment programs for patients suffering from headache.

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