

PREVALENCE OF HEADACHE IN CHILDREN OF A SCHOOL FROM CURITIBA, BRAZIL, COMPARING DATA OBTAINED FROM CHILDREN AND PARENTS

SÉRGIO ANTONIUK*, MARCELO FELIPE KOZAK**, LEANDRO MICHELON**,
MÁRIO RODRIGUES MONTEMÓR NETTO**

ABSTRACT - This study analyzed prevalence, frequency and cause of headache among 460 children ranging from 10 to 14 years-old from a Brazilian school. A questionnaire was handed both to children and parents to know if there would be differences among children and parental reports. The lifetime prevalence of headache was 93.5% (children reports) and 93.3% (parental reports). The last year prevalence was 90% (children) and 89.8% (parents). Headache episodes were frequent in 17.6% (children) and 18.5% (parents). The most often reported cause was "flu" (39.1% by children, and 46.7% by parents). This study demonstrated that the prevalence of headache in children is high; moreover, there were noted few differences between data obtained from children and parents. So, we could say that when the objective of an epidemiologic study is to determine the prevalence of headache in children, both children and parental reports may be used.

KEY WORDS: headache, schoolchildren, epidemiology.

Prevalência de cefaléia em crianças de uma escola de Curitiba, Brasil, comparando dados obtidos de crianças e pais

RESUMO - Este estudo analisou prevalência, frequência e motivo da cefaléia entre 460 crianças de 10 a 14 anos de uma escola brasileira. Com a finalidade de saber se haveria diferenças obtendo informações das crianças ou dos pais, um questionário foi entregue a ambos. A prevalência durante a vida foi 93,5% (relatos das crianças) e 93,3% (relatos dos pais). A prevalência nos últimos 12 meses foi 90% (crianças) e 89,8% (pais). As cefaléias foram frequentes em 17,6% (crianças) e 18,5% (pais). O motivo mais citado foi "gripe" (39,1% pelas crianças e 46,7% pelos pais). Esse estudo demonstrou ser alta a prevalência de cefaléia entre crianças; além disso, poucas diferenças entre dados obtidos de crianças e pais foram observadas. Dessa forma, poderíamos dizer que quando o objetivo de um estudo epidemiológico é determinar a prevalência de cefaléia em crianças, tanto os relatos das crianças como os dos pais podem ser utilizados.

PALAVRAS-CHAVE: cefaléia, escolares, epidemiologia.

Headache is one of the most common causes of consultation to the pediatrician¹. Headache disorders are a "social" phenomenon of considerable dimensions because they may interfere in the patient's life and in his/her family's quotidian, principally when they are severe and frequent, causing considerable suffering as well as decreased or abolished working capacity².

Generally, headache is a common and benign symptom among schoolchildren and adolescents; however, it is less frequent and seems to be related to more severe pathologies in younger children³. Most of the patients seen for headache in a walk-in clinic did not have a serious symptomatic cause; they have, instead of, an acute febrile illness associated with their complaint⁴.

Estudo realizado junto ao Departamento de Pediatria do Hospital de Clínicas (HC) da Universidade Federal do Paraná (UFPR), Curitiba, Brasil: *Professor Assistente de Neuropediatria do Departamento de Pediatria do HC/UFPR; **Acadêmico do 6º ano do curso de Medicina, Setor de Ciências da Saúde, UFPR. Aceite: 11-agosto-1998.

Dr. Marcelo Felipe Kozak - Rua 13 de maio 1062/03 - 80510-030 Curitiba PR - Brasil - FAX +55 041 225 3432.

In the life of a child, school represents an important stress factor similar to that of working life in adulthood⁵. To approach puberty, that occurs at an age of about 13 years, is also a stress factor. In Brazil, due to its particular social and economic characteristics, the uncertainty in the life of many students, who sometimes have to decide between to pursue their academic lives or to look for a job to help their familial income, is another stress factor. All these factors increase the incidence of psychosomatic disorders and symptoms like headache⁶.

The classification and epidemiology of headache disorders in pediatrics is well worth studying for some reasons. First, epidemiologic studies determine the scope and distribution of the public health problems related to headache. Second, these studies will help identify the risk factors for various pediatric headache disorders. Third, longitudinal studies can help define the natural history of headache disorders in childhood. Fourth, these studies can help determine the level of health care utilization and define the health care needs. And, finally, epidemiologic studies can facilitate a clinical standardization applicable both to children and adults^{7,8}.

The objectives of the present study were (i) to determine the prevalence of headache in children of a school from the city of Curitiba (south of Brazil) and (ii) to make an comparative analysis among information obtained from children and parents. The two main reasons that let us to initiate this study were: first, the fact that headache is one of the most important complaints involuntarily mentioned by children and, second, the discrepancies often found between child and parental report⁹.

METHODS

Subjects: 755 children ranging from 10 to 14 years of age matriculated from the 5th to the 8th year of a public school from the city of Curitiba, PR, Brazil, during the 1st semester of 1997.

Material: a questionnaire with 4 questions: 1. Did you ever have headache in your life? (yes or no); 2. Did you have headache in the last year? (yes or no); 3. What was the frequency of headache attacks in the last year? (rarely, at least once a month, more than once a week, almost every day, "other" or "don't know"); 4. What was the cause of the headache? (a hit in head, flu, nervousness, difficulty to see, migraine, sinusitis, allergy, "other" and/or "don't know"). The same model of questionnaire was delivered to parents answer about their children. Data as name, age and sex were also obtained.

Methods: first of all, we obtained the permission from the directory of the school to perform this study. After, we went to the classrooms and explained to teachers and students we were doing a research about headache. Then, the questions were read aloud and the children were directed to make questions if there was any doubt. Finally, the questionnaires were distributed to the students, who had 10 minutes to fulfill them. The notation of more than one response in the last question was allowed. The questionnaires were collected after all students had answered them. After this first part, we distributed the questionnaires destined to the children's parents, which ought to be returned in two days, when we would collect them. The distribution of frequency and cause of headache was analyzed only in the questionnaires where there was complaint of headache in the last year. To compare the data obtained from children and parents, only the questionnaires of the students whose parents answered them were analyzed. To evaluate the results, we used a descriptive method, as guided by the Statistic Laboratory of the Universidade Federal do Paraná, Brazil.

RESULTS

A total of 755 questionnaires were distributed to students and parents. Of the 755 questionnaires handed to the parents, 555 (73.5%) were answered by them. However, only 460 (60.9%) could be evaluated. The others (95) were excluded because they were not well fulfilled by children and/or parents. Of the 460 students evaluated, 274 (59.6%) were girls and 186 (40.4%) boys. The mean age was 11.9 years (Table 1).

Questionnaires from children

The lifetime prevalence of headache was 93.5% (female = 94.5%; male = 91.9%). Considering age and gender, it was observed that all the girls of 14 years of age had already presented headache, and that the boys of 13 years of age presented the lesser prevalence (Table 2).

Table 1. Distribution of the subjects by age and gender.

Age	10	11	12	13	14
Female	32	65	88	60	29
Male	25	43	56	37	25
Total	57 (12.4%)	108 (23.5%)	144 (31.3%)	97 (21.1%)	54 (11.7%)

Table 2. Lifetime prevalence of headache by age, gender and informant.

Age Informant	10		11		12		13		14	
	C	P	C	P	C	P	C	P	C	P
Female	93.7	87.5	98.5	98.5	90.9	90.9	93.3	95	100	100
Male	92	92	95.4	88.4	92.3	92.3	86.5	89.2	92	100
Total	93	89.5	97.2	94.4	91.7	91.7	90.7	92.8	96.3	100

C, children; P, parents.

Table 3. Last year prevalence of headache by age, gender and informant.

Age Informant	10		11		12		13		14	
	C	P	C	P	C	P	C	P	C	P
Female	87.5	78.1	96.9	96.9	89.8	89.8	91.7	91.7	100	100
Male	84	92	90.7	88.4	87.5	87.5	78.4	83.8	88	84
Total	86	84.2	94.4	93.5	88.9	88.9	86.6	88.7	94.4	92.6

C, children; P, parents.

The last year prevalence of headache was 90% (female = 92.7%; male = 86%). Considering age and gender, it was observed that all the girls of 14 years of age had headache in the last year, and that the boys of 13 years of age presented the lesser prevalence (Table 3).

Approximately 40% of the questionnaires revealed a rare frequency of headache episodes. One hundred and eighty-eight students (188 = 45.4%) had at least one episode a month; 73 of them (17.6%) had headache more than once a week or almost every day. Comparing gender and frequency of headache, it was noted that male students had less frequent episodes. In accord to age, it was observed that the oldest children had less frequent episodes of headache (Table 4).

The most common causes of headache were "flu" (39.1%), and "nervousness" (22.9%). Approximately 24% of the students did not know the provoking factor of the headache (Table 5). It is important to emphasize that of those children who had frequent headaches ("more than once a week" or "almost every day"), 19,2% did not know the reason of the pain, that represents 3% of the sample.

Questionnaires from parents

The lifetime prevalence of headache was 93.3% (female = 94.2%; male = 91.9%). Considering age and gender, it was observed that all the girls and boys of 14 years-old had already presented headache, and that the boys of 10 years of age presented the lesser prevalence (Table 2).

The last year prevalence of headache was 89,8% (female = 91.6%; male = 87.1%). Considering age and gender, it was observed that all the girls of 14 years of age had headache in the last year, and that the boys of 10 years of age presented the lesser prevalence (Table 3).

Table 4. Distribution of headache frequency according to age, gender and informant.

Age		10		11		12		13		14		Total		
Gender		F	M	F	M	F	M	F	M	F	M	F	M	F + M
Rarely	C	7 (21.9)	10 (40)	21 (32.3)	16 (37.2)	26 (29.5)	21 (37.5)	21 (35)	13 (35.1)	15 (51.7)	14 (56)	90 (35.4)	74 (46.2)	164 (39.6)
	P	13 (40.6)	10 (40)	27 (41.5)	22 (51.2)	41 (46.6)	24 (42.8)	19 (31.7)	17 (45.9)	14 (48.3)	11 (44)	114 (45.4)	84 (51.8)	198 (47.9)
At least once a month	C	8 (25)	4 (16)	16 (24.6)	11 (25.6)	25 (28.4)	14 (25)	17 (28.3)	9 (24.3)	8 (27.6)	3 (12)	74 (29.1)	41 (25.6)	115 (27.8)
	P	5 (15.6)	6 (24)	14 (21.5)	9 (20.9)	18 (20.4)	13 (23.2)	16 (26.7)	7 (18.9)	7 (24.1)	6 (24)	60 (23.9)	41 (25.3)	101 (24.5)
More than once a week	C	3 (9.4)	2 (8)	8 (12.3)	1 (2.3)	8 (9.1)	3 (5.4)	8 (13.3)	3 (8.1)	3 (10.3)	2 (8)	30 (11.8)	11 (6.9)	41 (9.9)
	P	2 (6.2)	3 (12)	10 (15.4)	3 (7)	7 (8)	3 (5.4)	13 (21.7)	3 (8.1)	5 (17.2)	2 (8)	37 (14.7)	14 (8.6)	51 (12.4)
Almost every day	C	6 (18.8)	1 (4)	4 (6.2)	1 (2.3)	6 (6.8)	5 (8.9)	5 (8.3)	1 (2.7)	3 (10.3)	2 (8)	24 (9.4)	8 (5)	32 (7.7)
	P	4 (12.5)	0	7 (10.8)	1 (2.3)	6 (6.8)	2 (3.6)	4 (6.7)	0	2 (6.9)	2 (8)	23 (9.1)	2 (1.2)	25 (6.1)
"Don't Know"	C	3 (9.4)	4 (16)	11 (16.9)	10 (23.3)	14 (15.9)	5 (8.9)	4 (6.7)	3 (8.1)	2 (6.9)	1 (4)	34 (13.4)	23 (14.4)	57 (13.8)
	P	0	2 (8)	7 (10.8)	1 (2.3)	3 (3.4)	4 (7.1)	3 (5)	2 (5.4)	1 (3.4)	0	14 (5.6)	9 (5.6)	23 (5.6)

C, children; P, parents.

Approximately 48% of the questionnaires revealed a rare frequency of headache episodes. One hundred and seventy-seven (177 = 42.8%) had at least one episode a month; 76 of them (18.4%) had headache more than once a week or almost every day. Comparing gender and frequency of headache, it was observed that boys had less frequent episodes: 60 girls (23.9%) whom had headache in the last year presented this symptom more than once a week and/or almost every day; among boys, this index was 9.8% (16 students) (Table 4).

The most common causes of headache were "flu" (46.7%), and "nervousness" (20.6%). Approximately 19% of the parents did not know the provoking factor of the headache (Table 5). It is important to emphasize that of those children who had frequent headaches ("more than once a week" or "almost every day"), 21% did not know the reason of the pain, that represents 3,5% of the sample.

Similarity between the answers comparing children and parental reports

The similarity among the answers of the first question was 96.7%. In the second question, the similarity was 96.3%. In the third question, this index was 40.9% and, finally, it was 29.6% in the fourth question. The answers were completely equal in 167 children (36.3%).

Table 5. Distribution of headache cause by age, gender and informat.

Age	10		11		12		13		14		Total			
	F	M	F	M	F	M	F	M	F	M	F	M	F+M	
Hit in head	C	0	2	5	2	4	6	4	1	2	2	15	14	29
	P	0	0	(8)	(7.7)	(4.6)	(4.5)	(10.7)	(6.7)	(2.7)	(6.9)	(8)	(5.9)	(8.8)
				(3.1)	(2.3)	(5.7)	(5.4)	(6.7)		(6.9)	(12)	(5.2)	(4.3)	(4.8)
Flu	C	9	7	27	19	28	20	19	7	13	13	96	66	162
	P	(28.1)	(28)	(41.5)	(44.2)	(31.8)	(35.7)	(31.7)	(18.9)	(44.8)	(52)	(37.8)	(41.2)	(39.1)
		11	8	30	24	39	23	21	10	14	13	115	78	193
		(34.4)	(32)	(46.2)	(55.8)	(44.3)	(41.1)	(35)	(27)	(48.3)	(52)	(45.8)	(48.1)	(46.7)
Nervousness	C	7	3	18	9	20	10	11	5	7	5	62	33	95
	P	(21.9)	(12)	(27.7)	(20.9)	(22.7)	(17.8)	(18.3)	(13.5)	(24.1)	(20)	(24.4)	(20.6)	(22.9)
		6	3	14	6	20	8	11	7	6	4	57	28	85
		(18.8)	(12)	(21.5)	(14)	(22.7)	(14.3)	(18.3)	(18.9)	(20.7)	(16)	(22.7)	(17.3)	(20.6)
Difficulty to see	C	4	4	7	3	8	6	6	1	2	0	27	14	41
	P	(12.5)	(16)	(10.8)	(7)	(9.1)	(10.7)	(10)	(2.7)	(6.9)		(10.6)	(8.8)	(9.9)
		6	4	9	2	9	7	7	2	4	2	35	17	52
		(18.8)	(16)	(13.8)	(4.6)	(10.2)	(12.5)	(11.7)	(5.4)	(13.8)	(8)	(13.9)	(10.5)	(12.6)
Migraine	C	1	1	4	1	3	1	3	0	1	1	12	4	16
	P	(3.1)	(4)	(6.2)	(2.3)	(3.4)	(1.8)	(5)		(3.4)	(4)	(4.7)	(2.5)	(3.9)
		2	0	4	2	4	2	6	1	3	0	19	5	24
		(6.2)		(6.2)	(4.6)	(4.5)	(3.6)	(10)	(2.7)	(10.3)		(7.6)	(3.1)	(5.8)
Sinusitis	C	2	0	4	0	9	4	5	3	2	1	22	8	30
	P	(6.2)		(6.2)		(10.2)	(7.1)	(8.3)	(8.1)	(6.9)	(4)	(8.6)	(5)	(7.2)
		3	0	3	2	8	2	5	2	4	2	23	8	31
		(9.4)		(4.6)	(4.6)	(9.1)	(3.6)	(8.3)	(5.4)	(13.8)	(8)	(9.2)	(4.9)	(7.5)
Allergy	C	1	2	3	2	2	1	0	0	3	3	9	8	17
	P	(3.1)	(8)	(4.6)	(4.6)	(2.3)	(1.8)			(10.3)	(12)	(3.5)	(5)	(4.1)
		2	2	4	5	5	4	4	2	2	4	17	17	34
		(6.2)	(8)	(6.2)	(11.6)	(5.7)	(7.1)	(6.7)	(5.4)	(6.9)	(16)	(6.8)	(10.5)	(8.2)
"Don't Know"	C	9	3	14	10	17	9	18	11	8	2	66	35	101
	P	(28.1)	(12)	(21.5)	(23.3)	(19.3)	(16.1)	(30)	(29.7)	(27.6)	(8)	(26)	(21.9)	(24.4)
		4	4	15	7	11	8	17	6	3	3	50	28	78
		(12.5)	(16)	(23.1)	(16.3)	(12.5)	(14.3)	(28.3)	(16.2)	(10.3)	(12)	(19.9)	(17.3)	(18.9)

C, children; P, parents.

DISCUSSION

Headache is a subjective complaint without any laboratory correlate, thus any prevalence assessment must be based exclusively on information given by the subjects². The methodological differences among studies about headaches in children and the lack of standardized case definitions have plagued epidemiological studies of headache and have contributed to the enormous variation in estimates of the prevalence and incidence of primary headache disorders, not allowing systematical comparisons^{2,7,10}. Another source of error is the discrepancy often found between child and parental

Table 6. Results of previous studies.

Author, Country-year	Population	Sample	Age	Lifetime prevalence	Last year prevalence
Rasmussen et al. Denmark – 1988	Community	740	25-64	96% female = 99% male = 93%	-
Silanpää Finland – 1983	School- children	2921	14	69%	-
Silanpää, Finland – 1976	School- children	4825	7	37%	-
Waters	Girls	-	10-16	93%	-
Bille Sweden – 1962	-	-	13	male = 58% female = 59.3%	-
Andrasik et al	School- children	-	-	99.7%	-
Mortimer et al. United Kingdom 1992	Community	317	9-11	male = 78.4% female = 74.2%	54.9% male 51.6% female
Raieli et al. Italy – 1995	School- children	1445	11-14	- 28% female	19.9% male
Egermarck-Ericsson et al. Sweden – 1982	School- children	402	7, 11, and 15	75%	-
Barea et al. Brazil – 1996	School- children	538	10-18	93.3% female = 94.4% male = 92.3%	82.9% female = 87.9% male = 77.9%

report⁹. Otherwise, problems of selection biases are less severe in pediatric headache due to the excellent school-based studies, because these settings provide reasonably representative samples of children living in an particular area¹¹. For these reasons we preferred to conduct the present study in a school using questionnaires answered both by students and parents.

The similarity among the answers was very high in the two first questions. It allow us to say that in children of 9 or more years of age, the prevalence of headache may be determined by questionnaires answered by children, because in the present study it was observed that children and parental reports have the same value. It is important to mention that children and even parents are not obligated to understand terms such “migraine”, “sinusitis” or “allergy”, thus the results about the cause of headache in this study may be not so reliable because they were very dependent of previous knowledge by the subjects. Nevertheless, if we consider the great number of children and parents who marked the response “don’t know”, we can say that they probably have never looked for a medical assistance or that their headaches did not bring worrisome to them.

Our study observed that lifetime prevalence of headache was very high among the students analyzed. These results are comparable to those reported in Barea et al. study¹², which found a lifetime prevalence of 93,2% in Brazilian schoolchildren, and to those reported by Rasmussen et al.², who stated that only 4% of the total population have never had a headache episode. Other studies also found a high prevalence of headache among students: 69% by age 14^{13,14}; 93% of the girls of 10 to 16 years-old¹⁵; two thirds of children of 13 years of age¹⁶; 99.7%⁵; 56% of the boys and 55% of the girls¹⁷ (Table 6).

The last year prevalence was about 90%, as elevated as that found by Barea et al.¹², which was 82,9%. Mortimer et al.¹⁷ observed that the last 12 months prevalence among children of 9 to 11 years-old was 54.9% for boys and 51.6% for girls. Raielli et al.¹⁸, however, found a lower prevalence: 19.9% for boys and 28% for girls, both in the age group of 11 to 14 years-old (Table 6).

In our sample, the major part of the students had few headache episodes in the last year, and it was observed that girls have more frequent episodes than boys. These findings are in agreement with previous studies. According to Kristjánsdóttir and Wahlberg¹⁹, the headache prevalence is significantly higher among girls than boys. We found a higher number of children having rare headache episodes than having frequent ones in all ages. Egermarck-Ericksson²⁰ reported that headache was more common in older (11 and 15 years of age) than in younger children, and more common in girls with 15 years of age than in boys of the same age. Similar results were reported by Bille¹⁶ in children of 10 to 15 years-old, as well as by Öster²¹. On the other hand, Bille¹⁶ did not observe significant differences in prevalence of headache considering sex in children of 7 years of age. Besides, Sillanpää⁶ reported that a frequency of less than once a month is as common in boys as in girls; however, higher frequencies are more common in girls. Most would argue that the gender difference is mainly due to hormonal changes; however, Deubner²² found no significant relationship between menarch status of the girls he studied and the presence of headache nor to headache severity, frequency or duration. Nevertheless, as stated by Kristjánsdóttir and Wahlberg¹⁹, the inconsistent differences found by gender indicate that other factors than gender and age might play a greater role in the prevalence of headache in children. It is important to emphasize that approximately 3% of the students had frequent headache episodes, and were not able to state the provoking factor. These children should be guided to look for a medical assistance.

Among the provoking factors, the most often reported were "flu" and "nervousness". It is in agreement with the results presented in a review of flow-sheet of children who sought consultations in a Brazilian Hospital complaining of headache: the most common diagnoses were upper airway infections (26%), sinusitis (15%), emotional factors (15%), and visual disorders (15%)³. In another study²⁰, the factors that provoked headache most often were "stress" (15%), illness (14%), and noisiness at school (13%); 50% of the children with headache could not state any provoking factor. In our study, the misunderstanding about the causal factor was relatively high both for children and parents, but we did not found differences according to age (Table 5).

CONCLUSIONS

The results of the present study confirmed our first impression that would have a high prevalence of children suffering from headache in our environment. It gives emphasis to the important health problem that headache disorders represent among children.

When we compared questionnaires with information gave by children and parents, we could notice that, in general, there were not great differences between the results, particularly in the simplest questions, where "yes" or "no" were the only possible responses. So, we could say that when the objective of a epidemiologic study is to determine the prevalence of headache in children, both children and parental reports may be used.

REFERENCES

1. Duffner PK. Headaches in children. 48th Annual Meeting of the American Academy of Neurology, 1996.
2. Rasmussen BK, Jensen R, Schroll M, Olesen J. Epidemiology of headache in a general population: a prevalence study. *J Clin Epidemiol* 1991;44:1147-1157.
3. Rotta NT, Lago IS, Ohlweiler L, et al. Cefaléias como queixa ambulatorial em pediatria. *Revista do HCPA* 1985;5:25-27.
4. Kandt RS, Levine RM. Headache and acute illness in children. *J Child Neurol* 1987;2:22-27.
5. Andrasik F, Holroyd KA, Abell T. Prevalence of headache within a college student population: a preliminary analysis. *Headache* 1980;19:384-387.
6. Sillanpää M. Prevalence of headache in prepuberty. *Headache* 1983;23:10-14.

7. Linet MS, Stewart WF. Migraine headache: epidemiologic perspectives. *Epidemiol Rev* 1984;6:107-139.
8. Lipton RB, Silberstein SD, Stewart WF. An update on the epidemiology of migraine. *Headache* 1994;34:319-328.
9. Mindel JA, Andrasik F. Headache classification and factor analysis with a pediatric population. *Headache* 1987;27:96-101.
10. Stewart WF, Simon D, Schechter A, Lipton RB. Population variation in migraine prevalence: a meta-analysis. *J Clin Epidemiol* 1995;48:269-280.
11. Lipton RB. Classification and epidemiology of headaches in children. 48th Annual Meeting of the American Academy of Neurology, 1996.
12. Barea LM, Tannhauser M, Rotta NT. An epidemiologic study of headache among children and adolescents of southern Brazil. *Cephalalgia* 1996;16:545-549.
13. Sillanpää M. Prevalence of migraine and other headache in Finnish children starting school. *Headache* 1976;15:288-290.
14. Sillanpää M. Changes in the prevalence of migraine and other headaches during the first seven school years. *Headache* 1983;23:15-19.
15. Waters WE. The epidemiology of migraine. Bracknell: Boehringer Ingelheim, 1974.
16. Bille B. Migraine in schoolchildren. *Acta Paediatr Scand* 1962;51:Suppl 136.
17. Mortimer MJ, Kay J, Jaron A. Epidemiology of headache and childhood migraine in an urban general practice using AD HOC, Vahlquist and IHS criteria. *Dev Med Child Neurol* 1992;34:1095-1101.
18. Raieli V, Raimondo D, Cammalleri R, Camarda R. Migraine headache in adolescents: a student population-based study in Monreale. *Cephalalgia* 1995;15:5-12.
19. Kristjánssdóttir G, Wahlberg V. Sociodemographic differences in the prevalence of self-reported headache in Icelandic schoolchildren. *Headache* 1993;33:376-380.
20. Egermarck-Eriksson I. Prevalence of headache in Swedish schoolchildren. *Acta Paediatr Scand* 1982;71:135-140.
21. Öster J. Recurrent abdominal pain, headache and limb pains in children and adolescents. *Pediatrics* 1972;50:429-436.
22. Deubner DC. An epidemiologic study of migraine and headache in 10-20 years-old. *Headache* 1977;17:173-180.