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Prevalence of primary headaches in adolescents

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Abstract

Background: The aim of this study was to estimate overall prevalence of primary headaches and prevalence of migraine (MG) and tension-type headache (TTH) among adolescents in the Republic of Moldova.

Metietal and methods: In total there were 3389 adolescents whose age ranged from 10 to 19 years, recruited from urban and rural areas of the country. This school-based study was conducted during the academic year 2015-2016. The information was collected with the use of self-administered questionnaire based on the criteria of International Classification of Headache Disorders: ICHD-2 (2004) and ICHD-3 (2013). Primary headaches were classified, according to the type of headache and after the frequency of headache attacks within the month.

Results: The overall prevalence of primary headaches in Moldovan adolescents is 38.75% (girls – 49.7%, boys – 27.8%), and it is higher in urban area (48.23%) than in rural (30.05%). The prevalence of MG is 19.7%. The prevalence of MG is higher in girls (27.5%) than in boys (12.1%). The prevalence of migraine is higher in urban adolescents (27.1%) compared to rural ones (13.0%). The prevalence of TTH is 7.9%. The prevalence of TTH is almost equal in both sexes (8.0% in girls and 7.7% in boys). The prevalence of TTH in urban adolescents is 10.2% and it is more than 1.7 times higher compared to the recorded level in rural areas – 5.8%.

Conclusions: The present study is the first Moldovan survey on epidemiology of headaches in adolescents. It is very important to continue developing different aspects of epidemiology of adolescents' headaches in the Republic of Moldova.

Key words: prevalence, headache, adolescents, migraine, tension-type headache.

Introduction

Epidemiology of primary headaches among adolescents is an important scientific subject. The number of epidemiological studies in primary headaches in adolescents increased considerably in the last years. Estimation of overall prevalence of primary headaches and prevalence for every type of migraine (MG) and tension-type headache (TTH) is important for measurement of their impact in adolescence. Overall prevalence of primary headaches in adolescence ranges from 21% to 91% [1, 5]. Reported range of migraine prevalence in adolescents is 6.3% – 21.3% [1, 2]. Reported range for tension-type headache prevalence is 5.1% – 25.9% [10, 12]. Epidemiology of primary headaches at the national level in adolescents in the Republic of Moldova was studied for the first time. The study of epidemiological particularities of primary headaches in adolescents was performed for estimating the general prevalence of headaches, specific prevalence for each type (migraine and tension-type headache) and prevalence for each subtype of MG and TTH (infrequent episodic migraine, frequent episodic migraine,

chronic migraine, rare episodic tension-type headache, frequent episodic tension-type headache, and chronic tension-type headache) by age, gender, geographical area, and residence area.

Material and methods

Methods of selecting and designing the study sample

Current scientific research is a descriptive epidemiological study. The sample for this research was composed of 3389 teenagers aged 10–19 years and is representative for the adolescent population in the Republic of Moldova. The group of respondents was stratified as it is shown in table 1. Urban area was represented by two big cities Chisinau and Balti. Rural area was divided into the North, Center and South and was represented by small towns from each area.

The study sample was divided into the clusters. As a cluster served a medium size school class (30 students). The total number of clusters constituted 112. The clusters have been randomly selected from the list of educational institutions. Taking into account the probable variations in the

Table 1

Distribution of the sample by demographic criteria

Urban (N = 1706)				Rural (N = 1683)			
Males (N = 785)		Females (N = 920)		Males (N = 728)		Females (N = 955)	
10-14 y	15-19y	10-14y	15-19y	10-14y	15-19y	10-14y	15-19y
(N = 408)	(N = 375)	(N = 447)	(N = 473)	(N = 424)	(N = 294)	(N = 426)	(N = 525)

number of adolescents in the classes, 3600 questionnaires were originally distributed, out of which 3389 were validated, which constituted the volume of the research sample.

Methods of collecting information

This school-based study was conducted during the academic year 2015–2016, avoiding the period of tests, these or examinations. Data for the research was collected using a self-administered, complex, structured questionnaire, based on the International Classification of Headache Disorders (ICHD). ICHD-II (2004) and ICHD-III (2013) beta criteria, comprised 7 chapters, with a total of 56 questions [2, 4, 7]. Clinical issues of headache were evaluated in Chapter III of the questionnaire titled “Headache in Adolescents”, which contains questions that reflect the criteria for the diagnosis of MG and TTH and their forms in strict accordance with ICHD-2 (2004). Headache was assessed using the ICHD-2 (2004) and ICHD-3 (2013) beta versions, so that the minimum acceptable duration was 1–2 hours for adolescents aged up to 18 years and 4 hours for those of 19 years old [2, 4, 8]. At the time the students filled in the self-administered questionnaire, they were supervised by the school psychologist and / or the supervisor. This procedure has ruled out the induction of answers. After completing, 3389 questionnaires were verified and validated. At the end of the “General Data” section, adolescents were asked to answer the question “Have you had headaches in the last half year that were not related to influenza or head trauma”, which was an exclusion criterion in survey for respondents, who answered “NO” (N = 1903). “YES” questionnaires (N = 1486) were divided, according to diagnosis, into 7 groups: PM (N=393), IEM (N=329), FEM (N=321), CM (N=115), ITTH (N=239), FTTH (N=69), CTTH (N=12) (fig. 1).

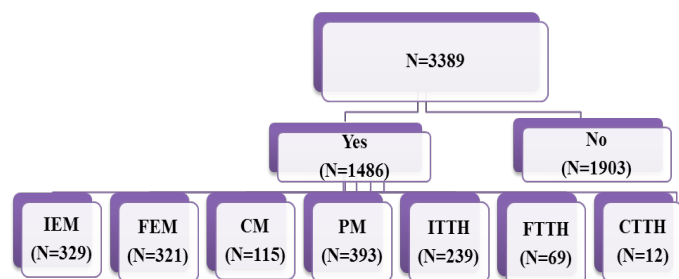


Fig. 1. Distribution of validated questionnaires.

The analysis of the descriptive data was performed by calculating averages and standard deviations in percent, with the 95% confidence interval for the continuous quantitative variables and ordinal variables. For the examination of associations between the category variables, the X²-test was applied. The statistical analysis was performed by applying IBM SPSS Statistics 22.

Results and discussion

Overall and specific prevalence of primary headaches in adolescents

The general prevalence of primary headaches in ado-

lescents in the Republic of Moldova was estimated 38.75% and it is comparable to the values presented in the literature – from 21% to 91% [1]. The general prevalence of primary headache is significantly higher (p<0.001) in girls than in boys (fig. 2).

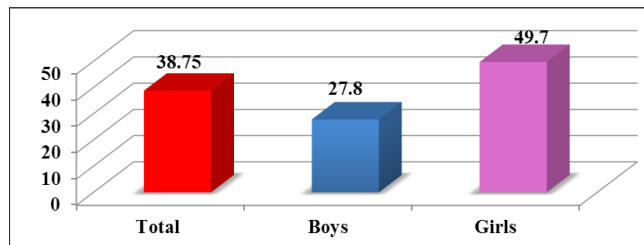


Fig. 2. General prevalence of primary headaches in adolescents by gender (%).

Primary headache prevalence values increased from 31.2% at 10 years to 61.3% at 19 years with a significant difference in values (p <0.001).

Analysis of the prevalence according to the residence environment indicates that the rural adolescents suffer from headaches 1.6 times less compared to urban adolescents (p<0.001), (fig. 3).

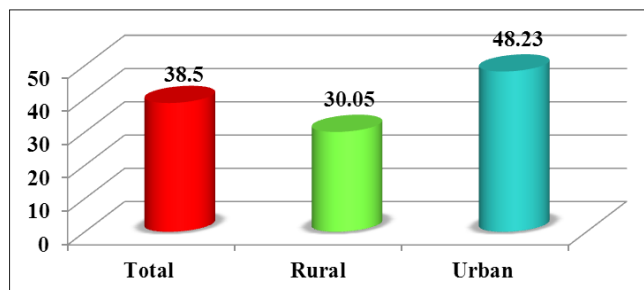


Fig. 3. General prevalence of primary headaches in adolescents depending on the residence environment (%).

Considering the geographical areas of the Republic of Moldova – North, South and Center, there was not detected significant difference in the prevalence values of primary headache in adolescents (p > 0.05%).

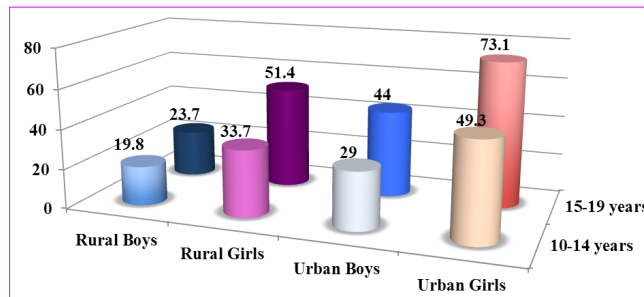


Fig. 4. Primary prevalence of primary headaches in adolescents by residence area, age groups and gender (%).

In both rural and urban areas, by gender and age groups, the overall prevalence of primary headaches is lower at the age of early adolescence (10-14 years) compared to late ado-

lescence (15-19 years) in both sexes ($p < 0.001$). During the adolescence period, the prevalence of primary headaches increases 1.5 times in both sexes, both in rural and urban areas, with higher values after 14 years of age. The lowest prevalence was 19.8% in 10-14 year old male adolescents in the rural area, and the overall prevalence of primary headaches of 73.1% was estimated in urban female adolescents aged between 15 and 19 years (fig. 4).

Structure of morbidity through primary headaches in adolescents

Primary headaches were classified, according to the type of headache, in MG and TTH. After the frequency of headache attacks within the month, in the form: infrequent – up to 4 days / month, frequent 5 – 14 days / month and chronic – more than 15 days per month. As a result, migraine was classified as infrequent episodic migraine (IEM), frequent episodic migraine (FEM), chronic migraine (CM). Episodic migraine was not classified in migraine with aura and migraine without aura, both forms being analyzed simultaneously. Probable migraine (PM) was defined as headache, which corresponds to all diagnostic criteria, except one for migraine with or without aura, stipulated in ICHD–III (2013) beta [4]. TTH was classified as infrequent episodic tension-type headache (ITTH), frequent episodic tension-type headache (FTTH), and chronic tension-type headache (CTTH).

The MG is most common type of headache in the adolescents in the Republic of Moldova with a prevalence of 19.7% (PM is 11.1%) and is higher than the median (8%) reported in the previous epidemiological studies [1, 10, 13]. The prevalence of TTH is 7.9% and it tends to be lower comparing to reported range 5.3% –25.9% in other research [5, 6, 9], (fig. 5).

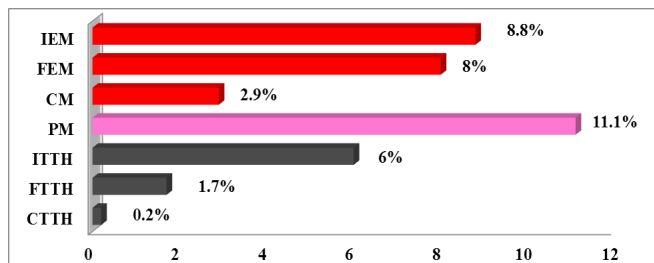


Fig. 5. Prevalence of primary headaches among adolescents in the Republic of Moldova.

In boys, MG prevalence is 12.1%, with a higher rate compared to the prevalence of TTH– 7.7%. In girls, the prevalence of MG is 27.5% and it is higher than TTH prevalence of 8.0%. Migraine, being the predominant type of primary headache in adolescents in our country, affects girls more frequently, having the 2.3 – fold higher prevalence compared to the prevalence of MG in boys. This difference is significant ($p < 0.001$) for all forms of MG, both episodic and chronic. PM in adolescent girls also is higher than in boys. The prevalence of TTH is almost equal in both sexes (fig. 6).

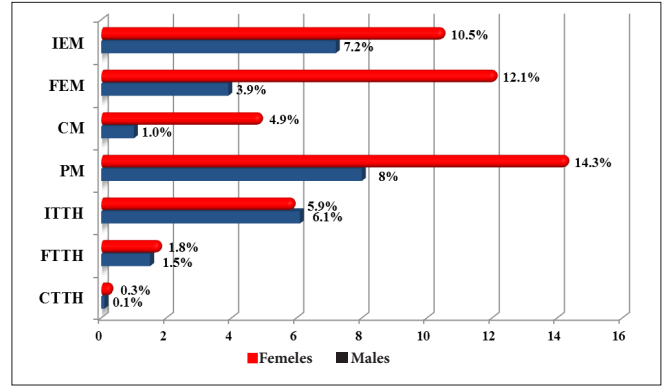


Fig. 6. Gender difference in prevalence of types and subtypes of headache in the RM.

The prevalence of migraine increases with age in both sexes, from 14.8% in early adolescence (10–14 years) to 28.2% in late adolescence (15–19 years). In girls up to 14 years, migraine prevalence is 20.2% (PM – 13.4%), and it is 38.5% (PM – 15.5%) in late adolescence. The prevalence of migraine in boys increases from 9.7% (PM – 7.9%) at the age of early adolescence, up to 16.2% (PM – 8.3%) in late adolescence. During the early adolescence, the infrequent form of episodic migraine affects both boys and girls equally, while frequent and chronic forms are found predominantly among girls. During late adolescence migraine in all forms of its manifestation affects girls more frequently, the gender difference being significant ($p < 0.001$).

At the age of 10–14, the prevalence of tension-type headache for both sexes is 6.2%, which increases to the age of 15–19 to 10.8%. This increases in boys from 5.9% at early adolescent age to 11.2% in late adolescence. In girls, the prevalence of tension-type headache is 6.6% at 10–14 years of age and it increases in late adolescence to 10.4%. The level of tension-type headache among both genders is similar in both age groups, with no statistically significant difference between prevalence values. By recording low prevalence rates, both in early adolescence and in late adolescence, this form of headache is more characteristic of the adult age (tab. 2).

Depending on the residence environment, the prevalence of MG is 2 times higher in urban adolescents – 27.1% compared to rural ones –13.0%. The prevalence of TTH in urban adolescents is 10.2% and is more than 1.7 times the recorded level in rural areas – 5.8%. Overall, the prevalence of tensional headache results in lower values compared to migraine prevalence (fig. 7).

The prevalence of MG in urban adolescents increases with age from 19.8% in early adolescence, up to 35.7% in late adolescence. In rural adolescents, there is also an increase in the prevalence of migraine, from 11.1% at 10-14 years to 16.8% at 15 - 19 years, but its values are lower compared to the prevalence of migraine in urban adolescents.

Similar to migraine, the prevalence of tension-type headache increases among adolescents in both urban and rural areas. In the urban area it increases from 8.2% during early adolescence to 12.6% in late adolescence. In rural areas

Table 2

The difference between the prevalence values of primary headaches by age group, gender and diagnosis ($p < 0.001$)

	10–14 years		Total	15–19 years		Total	Total		Total
	Males	Females		Males	Females		Males	Females	
W/A headache	846	616	1462	371	233	604	1217	849	2066
	76.4%	59.8%	68.4%	64.2%	35.5%	48.9%	72.2%	50.4%	61.3%
PM	88	138	226	48	102	150	136	240	376
	7.9%	13.4%	10.6%	8.3%	15.5%	12.2%	8.1%	14.2%	11.2%
IEM	67	78	145	54	96	150	121	174	295
	6.0%	7.6%	6.8%	9.3%	14.6%	12.2%	7.2%	10.3%	8.7%
FEM	34	102	136	30	102	132	64	204	268
	3.1%	9.9%	6.4%	5.2%	15.5%	10.7%	3.8%	12.1%	7.9%
CM	7	28	35	10	55	65	17	83	100
	0.6%	2.7%	1.6%	1.7%	8.4%	5.3%	1.0%	4.9%	3.0%
ITTH	48	53	101	54	47	101	102	100	202
	4.3%	5.1%	4.7%	9.3%	7.2%	8.2%	6.0%	5.9%	6.0%
FTTH	18	13	31	9	18	27	27	31	58
	1.6%	1.3%	1.4%	1.6%	2.7%	2.2%	1.6%	1.8%	1.7%
CTTH	0	2	2	2	3	5	2	5	7
	0.0%	0.2%	0.1%	0.3%	0.5%	0.4%	0.1%	0.3%	0.2%
TOTAL	1108	1030	2138	578	656	1234	1686	1686	3389
	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table 3

Difference between primary headache prevalence values by age groups, home environment, and type ($p < 0.001$)

Headache type	10-14 years			15-19 years			Total		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
No headache	923	539	1462	305	299	604	1228	838	2066
	73.5%	61.2%	68.4%	61.7%	40.4%	48.9%	70.2%	51.7%	61.3%
PM	130	95	225	66	84	150	196	179	375
	10.4%	10.8%	10.5%	13.4%	11.3%	12.1%	11.2%	11.0%	11.1%
IEM	71	74	145	38	112	150	109	186	295
	5.7%	8.4%	6.8%	7.7%	15.1%	12.1%	6.2%	11.5%	8.8%
FEM	56	80	136	30	102	132	86	182	268
	4.5%	9.1%	6.4%	6.1%	13.8%	10.7%	4.9%	11.2%	8.0%
CM	14	20	34	15	51	66	29	71	100
	1.1%	2.3%	1.6%	3.0%	6.9%	5.3%	1.7%	4.4%	3.0%
ITTH	49	52	101	33	68	101	82	120	202
	3.9%	5.9%	4.7%	6.7%	9.2%	8.2%	4.7%	7.4%	6.0%
FTTH	12	19	31	6	21	27	18	40	58
	1.0%	2.2%	1.5%	1.2%	2.8%	2.2%	1.0%	2.5%	1.7%
CTTH	1	1	2	1	4	5	2	5	7
	0.1%	0.1%	0.1%	0.2%	0.5%	0.4%	0.1%	0.3%	0.2%
Total	1256	880	2136	494	741	1235	1750	1621	3389
	100%	100%	100%	100%	100%	100%	100%	100%	100%

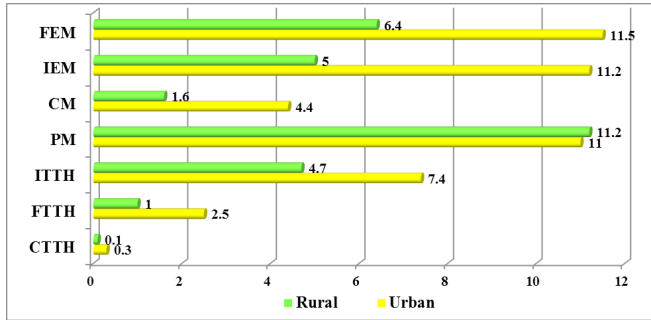


Fig. 7. Specific prevalence of primary headaches by residence environment (%).

the prevalence of tension-type headache at 10-14 years old is 5% and increases to the age of 15-19 years to 8.1%. For the North, Center and South geographic areas, there were not statistically significant differences in prevalence values for both migraine and tensional headaches, and for their forms (tab. 3).

Conclusions

1. The overall prevalence of primary headaches in adolescents in the Republic of Moldova is 38.75%. The prevalence of primary headaches in girls is 1.7 times higher than in boys. Adolescents in rural areas are 1.6 times less likely to have primary headaches than urban adolescents.

2. The prevalence of definite migraine is 19.7% (IEM – 8.8%, FEM – 8.0%, CM – 2.9%, PM – 11.1%). The prevalence of migraine in girls is 2.3 times higher than the prevalence of migraine in boys. The prevalence of migraine increases in both sexes from 14.8% in early adolescence to 28.2% in late adolescence. Depending on the residence environment, the prevalence of migraine is 2 times higher in urban adolescents than in rural ones.

3. The prevalence of TTH is 7.9% (ITTH – 6.0%, FTTH – 1.7%, CTTH – 0.2%). The prevalence of tensional headache is almost equal in both sexes (8.0% in girls and 7.7% in boys). The prevalence of TTH is similar in both genders in both age groups, with no statistically significant difference

between prevalence values. The prevalence of TTH in urban adolescents is 1.7 times higher than in adolescents in rural areas.

4. The present research is the first Moldovan survey on epidemiology of primary headaches in adolescents and it is very important to continue studying different aspects of epidemiology of adolescents headaches in the Republic of Moldova.

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