EATING DISORDERS IN 11–17 YEAR OLD SCHOOLGIRLS: PREVALENCE, FEATURES OF CLINICAL MANIFESTATIONS, PSYCHOSOMATIC COMORBIDITY

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ABSTRACT

Background. *Eating disorders are an urgent public health problem due to their high prevalence and mortality. The disease prognosis depends on timely diagnosis; however, these conditions are sure to be underestimated.*
The aim. *To study the prevalence, features of clinical manifestations and psychosomatic comorbidity of eating disorder (ED) and subthreshold eating disorder (SED) in schoolgirls aged 11–17 years.*
Material and methods. *We examined 917 schoolgirls aged 11–17 years. The screening questionnaire including 11 questions combined into three pools named "Thoughts about one's own body" was used. The first pool (A) – assessed body dissatisfaction, the second one (B) – eating disorders, the third one (C) – food intake disorders. The answers were encoded as "1", "2", "3" ("false", "rather true", "true"). Schoolgirls who scored the maximum number of points (12) in the pool A were regarded as dissatisfied with their body and were further divided into two groups: the first group (ED) included girls who scored more than 10 points in the pool B; girls who scored less than 10 points were in the second group (SED), respectively. Body mass index (BMI) was determined by the weight-height coefficient correlated with centile tables. Psychosomatic comorbidity was assessed by the presence of recurring headache and abdominal pains in the last six months.*
Results. *The overall prevalence of eating disorders was 11.7 %, where EDs made 2.1 %, SEDs – 9.6 %. All schoolgirls had abnormal eating behavior; however, those with SEDs used less aggressive weight-loss methods. BMI < 5th percentile was observed in 10 % of girls with EDs and 4.5 % – with SEDs. 60 % of girls with ED and 40.9 % with SED complained about frequent headaches; 30 % of girls with ED and 20.4 % with SED were suffering from frequent abdominal pain.*
Conclusion. *In schoolgirls, subthreshold eating disorder is 4.6 times more common than threshold eating disorder. Characteristics of clinical manifestations are the absence of underweight for most schoolgirls and comorbidity with pain syndrome.*

Key words: *eating disorder, subthreshold eating disorder, schoolgirls, prevalence, pain syndrome*

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НАРУШЕНИЯ ПИЩЕВОГО ПОВЕДЕНИЯ У ШКОЛЬНИЦ 11–17 ЛЕТ: РАСПРОСТРАНЁННОСТЬ, ОСОБЕННОСТИ КЛИНИЧЕСКИХ ПРОЯВЛЕНИЙ, ПСИХОСОМАТИЧЕСКАЯ КОМОРБИДНОСТЬ

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РЕЗЮМЕ

Обоснование. *Нарушения пищевого поведения являются актуальной проблемой здравоохранения, однако в детско-подростковом возрасте эти состояния часто недооцениваются.*
Цель. *Изучить распространённость, особенности клинических проявлений и психосоматическую коморбидность расстройств пищевого поведения (РПП) и подпороговых пищевых расстройств (ППР) у школьниц 11–17 лет.*
Материал и методы. *Обследовано 917 школьниц в возрасте 11–17 лет. Применялся опросник «Мысли о собственном теле», состоящий из трёх блоков. Первый блок (А) оценивал неудовлетворённость телом, второй блок (В) – нарушения пищевого поведения, третий блок (С) – нарушения приёма пищи. Ответы кодировались как «1», «2», «3» («не верно», «отчасти верно», «верно»). Девочки и девушки, набравшие 12 баллов в сумме ответов на блок А, расценивались как неудовлетворённые своим телом и далее делились на две группы в зависимости от результатов ответа на блок В: в группу РПП отнесены школьницы, набравшие более 10 баллов; в группу ППР – набравшие менее 10 баллов. Индекс массы тела определялся по весо-ростовому коэффициенту. Психосоматическая коморбидность оценивалась по наличию повторяющейся головной и абдоминальной боли.*
Результаты. *Общая распространённость нарушений пищевого поведения составила 11,7 %, из них: РПП – 2,1 %; ППР – 9,6 %. В обеих группах отмечалось аномальное пищевое поведение, но школьницы с ППР использовали менее агрессивные методы снижения веса. ИМТ < 5-го перцентиля имели 10 % школьниц с РПП и 4,5 % – с ППР. Жалобы на головные боли предъявляли 60 % школьниц с РПП и 40,9 % – с ППР; на боли в животе – 30 % школьниц с РПП и 20,4 % – с ППР.*
Заключение. *В детско-подростковом возрасте подпороговые пищевые расстройства встречаются в 4,6 раза чаще, чем пороговые. Особенностью клинических проявлений является частое отсутствие дефицита массы тела и коморбидность с болевым синдромом.*

Ключевые слова: *расстройства пищевого поведения, подпороговые пищевые расстройства, распространённость, болевой синдром, девочки, девушки, школьницы*

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OBJECTIVES

Eating disorders (EDs) are abnormal behavior associated with eating and preoccupation with food, which is accompanied by expressed concern about weight and figure. The main manifestations of EDs include anorexia nervosa (AN), bulimia nervosa (BN), and binge-eating disorder (BED). Risk factors for EDs are female gender, social factors (the presence of siblings, mass-media pressure), psychological (perfectionism, low self-esteem, negative emotions), and physical (overweight, slim parents) [1, 2]. Dissatisfaction with one's own body usually acts as a trigger mechanism of EDs [3–5]. Constant concern about the weight and (or) figure has a strong impact on self-esteem, leads to significant problems in important areas of functioning – personal, family, social, educational, professional. The prognosis of the disease is often unfavorable, which is explained by the persistent course of the disease, an indifferent attitude to one's health, ignoring medical appointments, and discontinuation of therapy [6–8].

The importance of EDs for public health is explained by their high prevalence, frequent comorbidity with other mental disorders [3, 9, 10], high mortality rates, mainly from complications from the cardiovascular system and suicide [11, 12]. The prevalence of AN, BN and BED among adults is 1–4 %, 1–2 % and 1–4 % [13]; among adolescents – 0.3 %, 0.9 % and 1.6 %, respectively [14]. However, the actual prevalence of EDs is much higher [2, 13], and, as studies show, no more than one third of patients are detected in the healthcare system [13].

Insufficient diagnosis of eating disorders in childhood and adolescence can be explained by the fact that many children and adolescents do not meet all the criteria of EDs, although they develop physical and psychological consequences caused by restrictions on food intake [15, 16]. Therefore, eating disorders in children and adolescents often have an atypical, latent nature, which can be regarded as subthreshold eating disorders (SED). Their significance is explained by their high prevalence in childhood and adolescence and the steady growth of relatively typical forms [15, 16, 17]. It is proved that the successful outcome of the ailment depends on timely diagnosis and early intervention [18, 19]. At the same time, the prevalence and features of clinical manifestations of eating disorders in children and adolescents remain poorly studied.

THE AIM OF THE STUDY

To study the prevalence, features of clinical manifestations and psychosomatic comorbidity of eating disorders and subthreshold eating disorders in schoolgirls aged 11–17.

METHODS

The study was conducted within the framework of the Eurasian Child & Adolescent Mental Health Study (EACMHS) [20]. Data collection was carried out in 2015–2018 in two major cities of Siberia – Novosibirsk and Krasnoyarsk. 11 secondary schools were surveyed in Novosibirsk, and 7 – in Krasnoyarsk. After receiving informed consent from parents, students were notified of the voluntary, anonymous and confidential nature of the study, and they were asked to fill out a questionnaire within an academic hour (45 minutes). The criteria for inclusion in the study were female gender, 11–17 years of age. The exclusion criteria were male gender and rejection of the study by parents or adolescent.

The continuous method was used to examine 917 girls aged 11–17 years (average age – 14.6 ± 1.3 years). Younger teenagers (11–13 years old) made up 168 subjects (18.3 %), middle (14–15 years old) – 468 subjects (51 %), older (16–17 years old) – 281 subjects (30.6 %).

A questionnaire developed as part of the EACMHS [1], which included several sections, was used in the study. Thoughts about your own body Section [21] allows the one to assess the presence of eating disorders and consists of 11 statements combined into three blocks. The first (A) block includes 4 statements revealing dissatisfaction with own body ("I am not satisfied with my body", "I am terrified of even a small weight gain", "I would like to be slimmer", "I am afraid to get fat"). The second (B) block includes 4 statements evaluating the symptoms of eating disorders ("I intentionally caused vomiting after eating", "I took medications to control my weight", "I train a lot to not gain weight", "I was on a diet"). The third (C) block includes 3 statements evaluating the symptoms of eating disorders ("I consume a large amount of food at a time", "I am not always able to control my food", "I have lost a lot of weight in a short time because I ate the wrong way"). There are 3 options of answers to each statement: "false", "partly true", "true", which were encoded as "1", "2", "3".

The responses were processed in two stages. At the first stage, the responses to the statements of block A were evaluated: schoolgirls who scored the maximum score in total (12 points) were regarded as dissatisfied with their bodies; schoolgirls who received a total of 4–11 points were assigned to the Control Group (CG). At the second stage, the symptoms of eating disorders in students dissatisfied with their bodies were assessed by the sum of the answers to the questions in block B: schoolgirls who received a total of 10 points or more were assigned to the ED group; the remaining adolescents were assigned to the SED group.

All schoolgirls had their body mass index (BMI) determined by the Quetelet index (weight expressed in kilograms)/height^2 (expressed in meters), with further interpretation according to the centile tables [22]. A percentile of less than 5 was interpreted as a weight deficit, from 5 to 85 – as a normal weight, from 86 to 95 – as overweight, over 95 – obesity.

Recurring pains were assessed by the frequency of a headache that interferes with concentration and the frequency of recurring abdominal pain over the past six months. There were 4 options of answers: "at least once a week", "at least once a month", "even less often", "almost never".

Ethical review

Approval for the study was received from the local Ethics Committee of the "Scientific Research Institute of Neurosciences and Medicine (minutes of the meeting No. 3 dated March 25, 2015). Anonymity of the study was achieved by filling out the questionnaire anonymously; by independently sealing one's questionnaire in a special envelope; by sealing all questionnaires in one common envelope.

Statistical analysis

Statistical processing of the obtained results was carried out using the IBM SPSS application software package, v. 22 (IBM Corp., USA). The type of distribution was determined using the Shapiro-Wilk test and Kolmogorov-Smirnov test. Statistical analysis of qualitative ordinal features was carried out by registering the number of objects in the sample having the same value of a qualitative variable, with further calculation of the relative frequency or proportion (%). The confidence interval (95% CI) for fractions and frequencies was estimated using the Wilson method. Comparison of groups by qualitative binary feature was carried out using the Pearson test χ^2 or Fisher's Exact Test (with the number of observations 5 or less). When describing statistical indicators, the absolute value of Pearson test χ^2 or Fisher's Exact Test, the number of degrees of freedom (df) for criterion χ^2 and the level of statistical significance of differences (p) were indicated. The level of statistical significance of the differences was established at $p = 0.05$, i. e. with an error probability of 5 %.

RESULTS

Prevalence of eating disorders

The overall prevalence of eating disorders was 11.7 %, of which ED – 2.1 %, SED – 9.6 % (Table 1).

In the age group of 11–13 years, the prevalence of disorders is the lowest and amounts to 1.6 %, and only subthreshold disorders are registered, while there are no clinically defined forms of eating disorders. At the age of 14–15 years, there is an increase in the prevalence of disorders up to 6.1 %, both due to an increase in SED by 3.2 times (up to 5.1 %) and due to the appearance of EDs (0.9 %). At the age of 16–17 years, there is a decrease in the overall prevalence of disorders to 4 % due to a decrease in subthreshold forms by 1.8 times (up to 2.8 %), while the threshold forms of ED increase to 1.2 %.

Features of clinical manifestations of eating disorders

Dissatisfaction with one's own body as the main symptom was noted in all schoolgirls with EDs. There was a fear of getting fat, an obsessive desire to lose weight, a desire to be slimmer, even a small weight gain was terrifying. 100 % of schoolgirls were on a diet, 95 % used medications to lose weight, 80 % caused vomiting, 45 % resorted to excessive sports or gymnastics (Fig. 1). The majority of girls and young women (75 %) noted that they lost a lot of weight in a short time because they "ate the wrong way". Symptoms of eating disorders in the form of consuming food in large quantities at a time were observed in 35 % of schoolgirls, binge-eating disorder – in 50 %. BMI analysis showed that the majority of schoolgirls (70 %) were of normal weight (5–85 percentiles), two subjects (10 %) had a body weight deficit (< 5th percentile), 4 subjects (20 %) were overweight (86–95 percentiles). There were no obese schoolgirls in the ED group (Fig. 2).

All girls and young women of this group had stable patterns of disturbed behavior aimed at avoiding food and striving for weight loss, which corresponded to the criteria of the ED. As for the specificity of clinical forms, 30 % should be considered of having BN, 10 % of schoolgirls – should be considered of having AN, and 15 % – should be considered of having BED. The remaining girls are classified as unspecified forms of EDs due to the discrepancy of BMI deficiency and/or the absence of such a clinical criterion as significant weight loss in a short time.

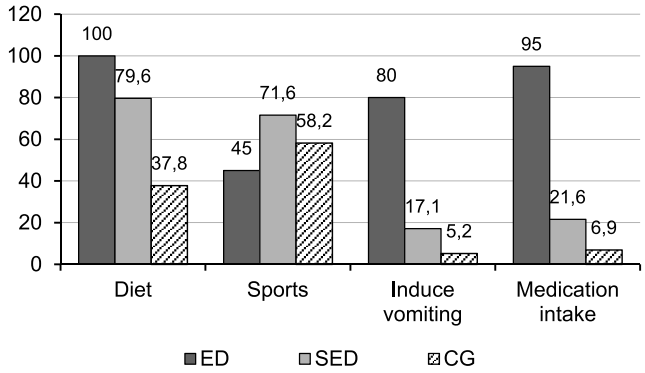

FIG. 1.

Frequency and methods of weight loss (%)

TABLE 1

PREVALENCE OF EATING DISORDER AND SUBTHRESHOLD EATING DISORDERS BY AGE (%, CI)

Age groups	Total	ED	SED
All ages (11–17 y. o.)	11.7 (9.8–14.0)	2.1 (1.4–3.3)	9.6 (7.8–11.7)
11–13 y. o.	1.6 (0.9–2.7)	0	1.6 (0.9–2.7)
14–15 y. o.	6.1 (4.7–7.8)	0.9 (0.5–1.8)	5.1 (3.9–6.7)
16–17 y. o.	4.0 (2.9–5.5)	1.2 (0.7–2.1)	2.8 (1.9–4.1)

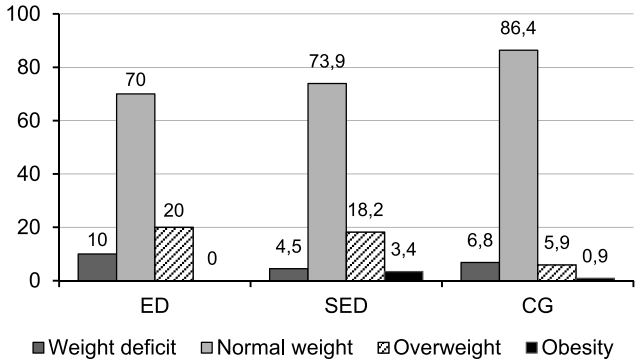

FIG. 2.
Distribution of respondents according to body weight (%)

Features of clinical manifestations of subthreshold eating disorders

All schoolgirls with SEDs were dissatisfied with their own body, the distorted image of which reached the level of super-valuable ideas, even a small weight gain caused horror. All girls and young women had symptoms of impaired eating behavior, but they differed in less severity and the use of less aggressive methods of combating excess weight, compared with the ED group (Fig. 2). Schoolgirls with SEDs were 4.7 times less likely to induce vomiting than schoolgirls with EDs (17.1 %; $\chi^2 = 38.1$; df = 2; $p < 0.001$), 3.4 times less likely to use medications (21.6 %; $\chi^2 = 47.7$; df = 2; $p < 0.001$), and less likely to resort to dieting (79.6 %; $\chi^2 = 11.8$; df = 2; $p = 0.003$). To reduce weight, the main emphasis was on sports (71.6 %; $\chi^2 = 14.1$; df = 2; $p = 0.001$). The result was not such a significant loss of body weight: only 11.3 % of schoolgirls said that they had lost weight significantly in a short time, and 40.9 % agreed with this only partially ($\chi^2 = 37.9$; df = 2; $p < 0.001$). Symptoms of eating disorders in the form of binge eating were noted with the same frequency as in the ED group (in 51.1 %; $p > 0.05$), and consuming large amounts of food at a time was 2 times less common (13.6 %; $\chi^2 = 6.1$; df = 2; $p = 0.05$). BMI analysis showed that the majority of girls and young women (73.9 %) were of normal weight, 4 schoolgirls (4.5 %) had a body weight deficit, 16 subjects (18.2 %) were overweight, three (3.4 %) were obese.

Association of eating disorders with recurring pain

Schoolgirls with eating disorders are more likely to complain of recurring pains, compared with the control group.

Thus, headaches are noted in 52.2 % of girls from the control group: 80% of schoolgirls with EDs and 70.4 % of schoolgirls with SEDs. At the same time, 60 % of schoolgirls with EDs and 40.9 % of schoolgirls with SEDs complain of frequent headaches (occurring every week for the last 6 months), which is 2 and 1.3 times more than girls and young women of the control group, respectively ($p = 0.003$; $\chi^2 = 20.21$; df = 6). The data obtained are shown in Figure 3.

Complaints of recurrent abdominal pains are presented by 46.6 % of schoolgirls in the control group, 65 % of schoolgirls with EDs and 56.8 % of girls and young women with SEDs. At the same time, frequent abdominal pains (occurring every week for the last 6 months) is noted by 30 % of schoolgirls with EDs and 20.4 % of schoolgirls with SEDs, which is 2.3 and 1.6 times more than in the control group (12.9 %).

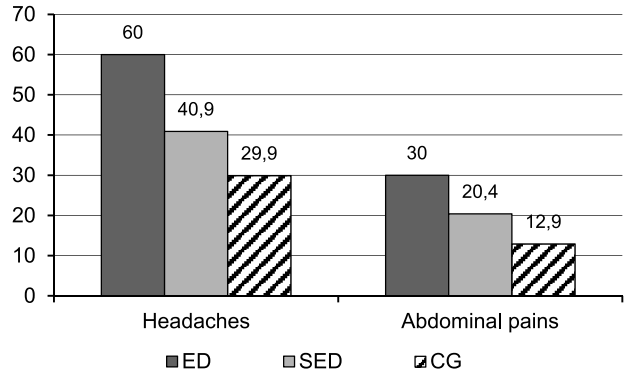

FIG. 3.
Frequent recurring pains (%)

DISCUSSION

Study main result summary

The overall prevalence of eating disorders in schoolgirls aged 11-17 years was 11.7 %, of which ED – 2.1 %, SED – 9.6 %. All schoolgirls had abnormal eating behavior, but girls and young women with SEDs used less aggressive methods of weight loss. BMI < 5th percentile was observed in 10 % of girls with EDs and 4.5 % – with SEDs. Complaints of frequent headaches were presented by 60 % of girls and young women with EDs and 40.9 % – with SEDs; for frequent abdominal pain – 30 % of girls and young women with EDs and 20.4 % – with SEDs.

Study main results discussion

According to the results of the study, the prevalence of eating disorders among schoolgirls aged 11–17 years is 11.7 %, subthreshold disorders predominate over threshold ones 4.5 times (9.6 and 2.1 %, respectively). Our data do not contradict the results obtained in European countries, where the threshold values of eating disorders were 2.9 %, and the subthreshold values were 11.5 % [23].

The age dynamics of the prevalence of eating disorders has shown that at the age of 11–13 years mainly subthreshold eating disorders are observed. At the age of 14–15 years, there is an increase in SED by 3.2 times, and clinically outlined forms of ED appear. At the age of 16–17 years, there is a decrease in subthreshold forms by 1.8 times, with a further increase in the threshold values of ED. Our data are consistent with the results of other authors, who confirm that subthreshold eating disorders are typical for adolescence, however, as they grow older, their frequency decreases, and only a small number of cases pass into adulthood [16]. This is due both to the physiological characteristics of adolescence and to the too narrow diagnostic framework of International Classifications of Diseases, according to which it is difficult to classify adoles-

cents into a certain group of ED, since they are often unable to formulate appropriate complaints due to insufficiently developed abstract thinking [24–26]. Therefore, unspecified, atypical or subthreshold types of eating disorders are more prevalent in adolescence [2], and the diagnostic transition, or crossover, is considered a common phenomenon and reflects the instability of ideas about a particular eating disorder [17, 19].

We have revealed that many schoolgirls, both with threshold and subthreshold values of ED, in the presence of a stable pattern of irregular eating behavior, there is no body weight deficit. At the same time, 18.5 % of schoolgirls have a BMI above the 85th percentile, which qualifies as excess weight, and 2.8 % have a BMI above the 95th, which is regarded as obesity. The data obtained by us are consistent with the opinion of other authors, who confirm that there may be no body weight deficit in eating disorders, and the BMI value does not always reflect the severity of the disease [27]. It has been shown that overweight adolescents are at risk for the development of EDs, and clinical manifestations of eating disorders in them have subthreshold values due to non-compliance of BMI with diagnostic criteria [28, 29].

Our study revealed that girls and young women with eating disorders are more likely than schoolgirls of the control group to complain of recurring pains, including headaches and abdominal pain. It is known that recurring pains in adolescents can occur simultaneously with EDs [30], and sometimes precede eating disorders [31]. Usually, such adolescents are initially diagnosed with abdominal pain, autonomic dysfunction or headache [32], which leads to late definition of the disease and worsens its course and prognosis. For example, recent catamnestic observations of children and adolescents discharged from the rheumatology department, where they were treated for chronic pain syndrome, showed that 22.4 % of young people were diagnosed with EDs in the future [30].

Therefore, internists in their practice should remember about eating disorders as one of the possible causes of pain in girls and young women, especially if the organic cause of pain is excluded. In this case, it is recommended to ask the question: *"Are you satisfied with your appearance?"* [27]. Upon receiving a negative answer, the doctor can conduct a short conversation, including the following questions: *"Would you like to become slimmer? Are you doing something for this? Have you been on a diet? Do you do a lot of sports? Do you control your weight with medication? Have you tried to intentionally induce vomiting?"*.

It should also be kept in mind that patients with EDs often dissimulate their condition. Therefore, doctors and parents are asked to evaluate the behavioral equivalents of symptoms indicating eating disorders: a teenager often measures his/her weight, evaluates his/her figure, expresses concern with his/her body verbally or in drawings [27]. Prodromal symptoms may also manifest as food restriction, episodes of overeating and vomiting ("purging"). If eating disorders are suspected, the patient should be referred to a psychotherapist to exclude the disease and start therapy in a timely manner, if necessary.

Study limitations

This study had a number of limitations. Firstly, conclusions about eating disorders were made on the basis of a screening examination, no further verification of the diagnosis was carried out, which reduces the diagnostic value of the results obtained. This is due to the fact that when planning the screening, we took into account the psychological characteristics of adolescence, and in order to obtain more valid answers, the survey was conducted anonymously. Secondly, this study was simultaneous, which reduces its predictive value and does not allow to trace the dynamics of clinical manifestations. Nevertheless, the conducted study provides a number of new knowledge that can be used in the practice of internists.

CONCLUSION

Thus, among schoolgirls aged 11–17, the prevalence of eating disorders is 11.7 %, most of them are represented by subthreshold values (9.6 %). The peculiarity of the clinical manifestations of EDs in childhood and adolescence is the absence of a body weight deficit in most children and adolescents in the presence of a stable pattern of impaired eating behavior.

Eating disorders in childhood and adolescence are often accompanied by pain syndrome, including recurrent abdominal pain (up to 65 %) and periodic headaches (up to 80 %), which makes such children and adolescents patients of somatic clinics. Therefore, internists need to remember about borderline conditions, one of which is eating disorders.

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Conflict of interest

The authors declare the absence of a conflict of interest.

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