

Occurrence of neurotic and anxiety disorders in rural schoolchildren and the role of physical exercise as a method to support their treatment

Hanna Krauss¹, Beata Buraczyńska-Andrzejewska¹, Jacek Piątek^{1,2}, Przemysław Sosnowski¹, Kinga Mikrut¹, Maciej Głowacki¹, Ewa Misterska¹, Wioletta Żukiewicz-Sobczak², Jacek Zwoliński²

¹ Department of Physiology, Department of Paediatric Orthopaedics, University of Medical Sciences, Poznan, Poland

² Department of Allergology and Environmental Hazards, Institute of Rural Health, Lublin, Poland

Krauss H, Buraczyńska-Andrzejewska B, Piątek J, Sosnowski P, Mikrut K, Głowacki M, Misterska E, Żukiewicz-Sobczak W, Zwoliński J. Occurrence of neurotic and anxiety disorders in rural schoolchildren and the role of physical exercise as a method to support their treatment. *Ann Agric Environ Med.* 2012; 19(3): 351-356.

Abstract

Introduction: School anxiety has become a common problem in children and adolescents. Despite numerous studies, it is difficult to definitely identify the cause of neurotic disorders in school-age children. The objective of the presented study was to assess the prevalence of neurotic disorders in rural schoolchildren and the role of physical activity as a method to support their treatment.

Material and methods: The study consisted of 123 girls and 117 boys living in rural areas of Wielkopolska. A questionnaire was provided evaluating family status, family relationships, school situation, somatic symptoms related to being at school, and the frequency of physical activity.

Results: It was found that over the 50% of children considered the relations with siblings as correct, but also acknowledged that there were a conflict situations in their relationship. Nearly 25% of children indicated an emotional irrelevance with their parents. About 20% of the young people did not like going to school or were afraid to stay there. Over the 50% of children declared somato-emotional problems associated with the being at school. The symptoms of neurotic disorders were more strongly expressed and more common in girls. Analysis of physical activity indicated that only a small group of young people practiced sport regularly, and an even smaller percentage of children exercised with their parents and/or peers.

Conclusions: The development of somatic and emotional disturbances in children may be associated with irregular family and school relationships and low physical activity. It was found that gender had a significant influence on most of the studied parameters.

Key words

rural school children, school neurosis

INTRODUCTION

A child with anxiety often has problems with making contacts with friends and has difficulty in dealing with teachers, which may add to problems with learning associated with stress from fear of negative assessment in the eyes of their peers and teachers. Due to a number of abnormalities in children with anxiety it is important to quickly identify and undertake the treatment of such disorders. In addition to psychotherapy, social therapy, and pharmacotherapy some method of physiotherapy to support the process of therapeutic methods is recommended. The main advantage is the ability to work in a group and activation through physical activity.

The occurrence of several clinical symptoms, such as tingling, headache, vegetative symptoms (sweating,

vasoconstriction), and fatigue can be effectively countered by a suitably chosen physical activity, both in the form of exercise and relaxation methods. The type of neurosis and its characteristics will allow for detailed discussion of methods supporting the treatment of this disorder through various forms of exercise. Neurosis is a mental disorder which has no known or suspected basis in organic pathology, and may lead to the distortions in behaviour and social adaptation [1]. According to Łapiński, neurosis is a disorder of internal balance and relationships with the environment. These disturbances leading to neurosis arise from internal conflicts and neurotic tendencies [2]. Kępiński believes that neurotic symptoms occur when the organism is in danger, and when it may not be able to cope with the external or internal situation [3]. It is believed that the trauma can cause anxiety if the organism is susceptible, which is associated with the generally understood constitution, with the properties of the nervous processes, and also damage of the nervous system. The constitutional disposition to neurosis is a special kind of sensitivity to psychotraumatic factors, which are referred to as psychoallergy. According to the literature,

Address for correspondence: Hanna Krauss, Department of Physiology, Department of Paediatric Orthopaedics, University of Medical Sciences, Poznan, Poland.
E-mail: hjk12@poczta.fm

Received: 2 April 2012; accepted: 17 August 2012

neurotic disorders are the result of social factors affecting the neurosogenic predisposition of biological origin [4]. In neurotic disorders of younger children, biological agents such as the presence of discrete organic factors related to the pathology of pregnancy, childbirth and early childhood is emphasized. In disorders of adolescence, the emphasis is on intrapsychic and interpersonal conflicts related to the emotional relationship with the closest people.

Many authors, however, emphasize that the nature of the biological factors may not be responsible for the occurrence of neurosis, and only make dealing with psychological and social problems more difficult. The literature indicates that children often encounter the slow effects of traumatic factors, including those primarily derived from the family environment. Most discussion is about a flawed family atmosphere and a defective educational system. A family neurosogenic atmosphere with emotional tension and conflict between parents and emotional rejection of a child is considered as particularly dangerous. A family with a faulty education system may be too rigid and strict or too lenient and inconsistent [5]. In addition to the family environment which may affect the second environment which in turn can contribute to the development of neurosis is the school environment. It is often recognized as a secondary cause, increasing children's emotional difficulties arising in the family or revealing various types of developmental disorders that cause learning difficulties, and also lead to neurotic disorders. The non-uniform terminology relating to children's neuroses reflects the complexity of the issue. Differences within the meaning of this issue are caused by:

- variability and diversity of clinical patterns;
- elusive and multiple etiology of disorders;
- individual differences in the course of the disorder;
- simultaneous rapid physical, mental and social development of a child.

Individual researchers can observe a tendency for the interpenetration of ideas. The differences do not relate to matters of substance, and are limited to the methodological aspect.

School Anxiety is a diverse group in terms of etiology, which is one form of anxiety neurosis (rare phobia), the main symptom of which is the fear of going to school. Characteristic for this type of disorder is the appearance of anxiety in children before going to an educational centre and anxiety symptoms while in school. Lack of early diagnosis of disorders in children can lead to school phobia, which is defined as a morbid fear of certain situations, people or activities [1]. The most common causes of school phobia development (a school neurosis) are:

- school start;
- school failures;
- decline in school performance in children who are doing well.

All of the above may result in different degrees of severity. The most common symptoms of school neurosis are disorders of the autonomic nervous system. As a result of long-lasting anxiety, a child may experience paroxysmal abdominal pain and vomiting while doing homework, during the stay in school, and on the way to school. In addition, in many children with school anxiety disorders, the first symptom is in the form of stuttering speech in stressful situations. All of the described reactions of the organism occur only when the

child is afraid of something. During days off from school no somatic symptoms are present in the child [6, 7].

OBJECTIVES

The aim of the research presented in this study was to assess the prevalence of neurotic disorders in children living in rural areas, their relationship with the relations prevailing at home, and an indication of the various forms of assisted treatment of neurotic disorders in this group.

MATERIAL AND METHODS

After obtaining permission from the director of the educational establishment, legal guardians of the subjects, and approval for research project by the Board of Education in Poznan on 26 September 2005, the study of children and young high school students was started. Based on an interview with the caregivers of the children and interviews with teachers, a group of 240 children was selected to study. The study consisted of 123 girls and 117 boys living in rural areas of Wielkopolska. As many as 92.5% of the children (228) had a complete family while only 12 of the respondents were from single-parent families. After explaining the aim of the study, questioning of selected groups was started. All children and young people taking part in the study was subjected to a survey conducted under comparable conditions. The Surveys were anonymous and consisted of closed questions arranged in subgroups. Subsequent questions were designed to determine:

- family status (full-incomplete family, education of parents, having siblings);
- relations between family (emotional relationships, addictions, ways of resolving conflicts, working conditions at home);
- school situation (accepting school, teachers, and peers, school performance and achievements); somatic symptoms related to: being in school, dealing with conflict resolution, homework assignments, and their frequencies.

RESULTS

The results were used to assess the incidence of neurotic disorders and school phobia among children and adolescents, and to assess the degree of their physical activity. The incidence of such disorders and their somatic and emotional symptoms in children who do well in school and children who have poor school performance were compared. Different ways of dealing with emotions in the family were analyzed. The behaviour at school and self-acceptance was analyzed. The frequency of physical activity and its form in all subjects tested was demonstrated. All the results obtained were checked by gender of respondents.

Among the 240 surveyed children, 98.75% of the respondents (237) had a sibling. Fig. 1 shows that over 50% of respondents consider their relations with siblings as correct, but also acknowledge that there are conflict situations in their relationship (Fig. 1). Nearly 25% of respondents indicated that in dealing with their parents they did not feel any emotion or felt indifferent (Fig. 2) in their relationship.

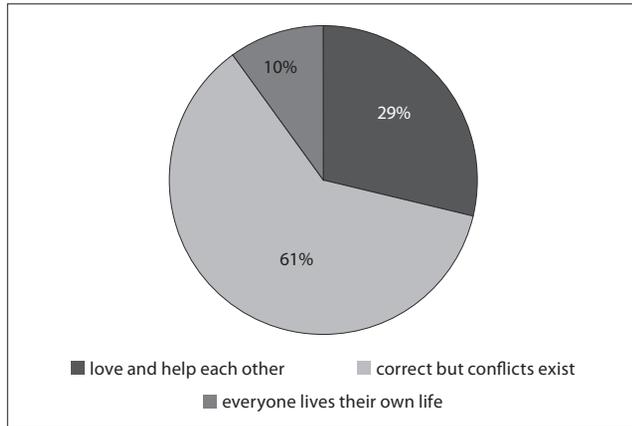


Figure 1. Emotional relationships with siblings

In order to analyze the possible impact of gender on the results, all the polls were analyzed. The results indicate that there is no apparent difference between the boys and girls. When comparing the gender of respondents, similar values were seen in answering each question. (Tab.1).

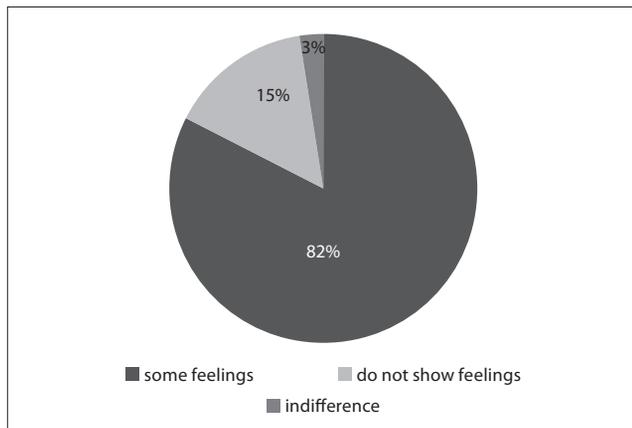


Figure 2. Perception of parents' feelings

Table 1. Comparison of emotional relationships of parents and siblings with regard to gender

EMOTIONAL RELATIONS:		GIRLS	BOYS
WITH SIBLINGS	We love and help each other	39	33
	Contacts are correct but conflicts exist	75	69
	Everyone lives their own life	9	15
WITH PARENTS	Some feelings	99	99
	Do not show feelings	18	18
	Indifference	6	-

Most of the children's feelings prevailing between them and their parents was assessed as positive. However, 25% of the children, in response to the question of how to resolve conflicts, indicated that difficult situations in their home are not discussed, or that any such discussion ends in a quarrel (Fig. 3). Nearly 14% of respondents admitted that corporal punishment is used at home.

Figures 4-8 illustrate the results of the atmosphere in the school and the relationship between teachers and peers. The survey shows that over 20% of respondents did not like going to school (57) or are afraid to stay there (9). Figure 4 compares

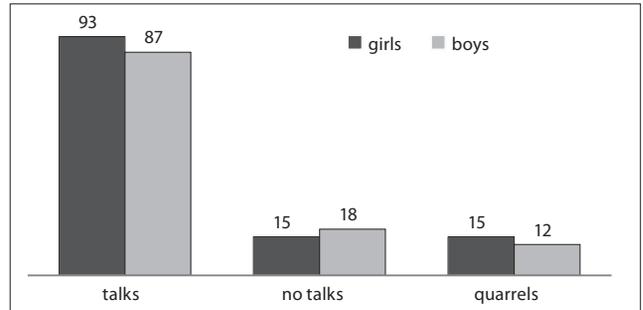


Figure 3. Ways to resolve difficult situations in the family, taking gender into account

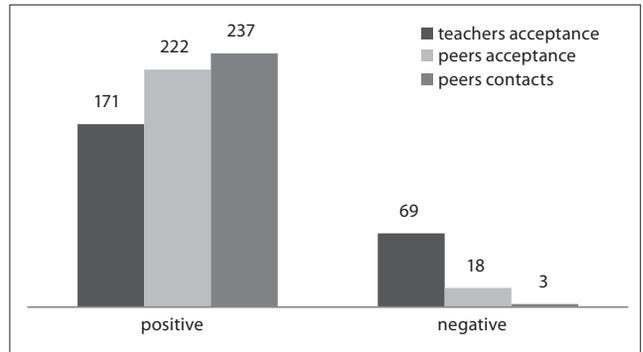


Figure 4. Comparison of perception of teachers and student peer group acceptance

the degree of acceptance among teachers and student peer group while Figure 5 shows the school performance. The results show a clear relationship between the obtained degrees and acceptance, both among peers and teachers.

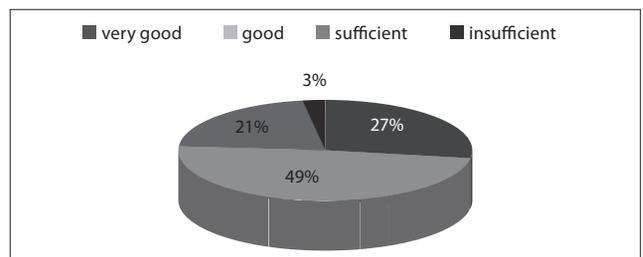


Figure 5. Percentage distribution of respondents' degrees

Detailed survey results were analyzed for somatic symptoms associated with school. They indicated the presence of somato-emotional problems as a result of being at school in 61% of respondents. Figure 6 illustrates the most common symptoms reported by respondents.

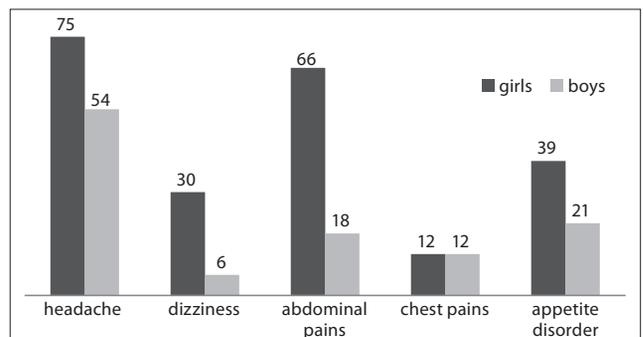


Figure 6. Comparison of somatic and emotional symptoms in boys and girls reported while at school

A similar number of respondents, as many as 59%, also reported emotional disturbances. These disorders were often or very often perceive by as many as 88% of respondents (Fig. 7).

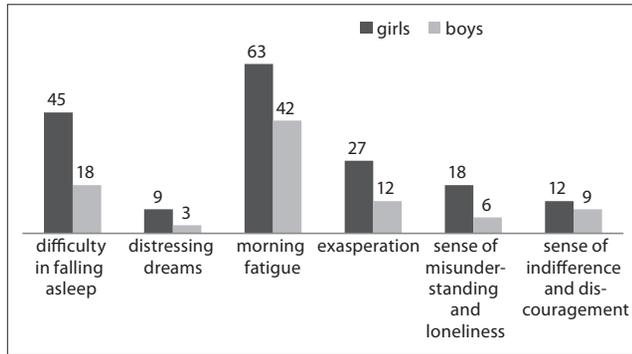


Figure 7. Comparison of emotional feelings related to school

Detailed analysis is also required to determine the feelings that accompany the response to the oral test. It should be noted that all respondents perceive themselves as having some symptoms associated with stress that accompanies verbal responses. The most common symptom was fear in the girls and boys in the group, dominated by an increased heart rate. Voice tremor observed at home was noted in almost half of the girls surveyed (Fig. 8).

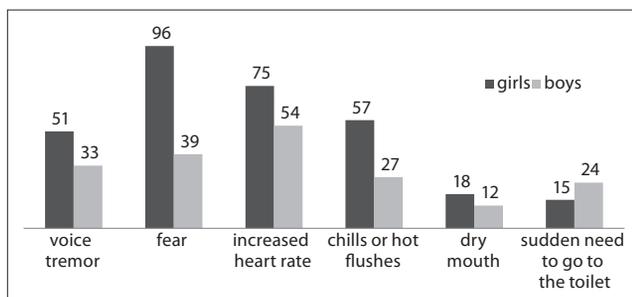


Figure 8. Comparison of the level of negative emotions induced in subjects during oral replies, by gender of respondents

A detailed analysis of the physical activity of the young people indicated that only a small group of the children practice sport regularly, and an even smaller percentage of respondents practiced with their parents and / or peers (Fig. 9).

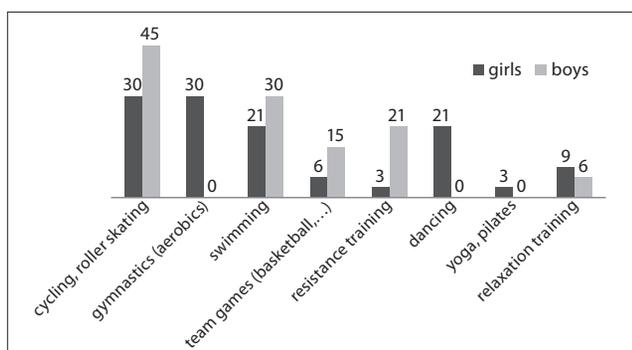


Figure 9. Comparison of preferred type of physical activity with regard to gender

Almost 50% of respondents admitted that they like cycling and swimming (Fig. 9). It is noteworthy that gymnastics

and dancing are often chosen by the girls, and strength and team sports by the boys. In the study group, only 18 children (7.5% of respondents) chose relaxing sports – relaxation or stretching exercises, figure shaping, and anti-stress activities like yoga or pilates (Fig. 10).

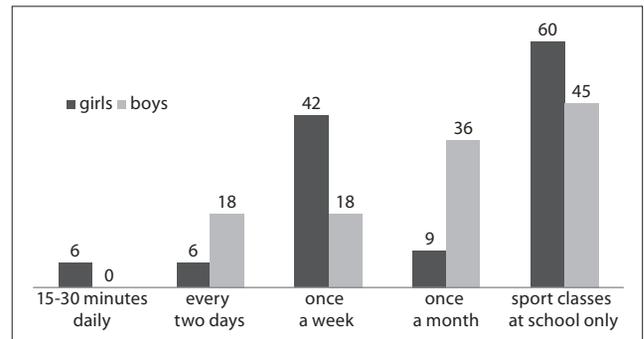


Figure 10. Comparison of sport activity frequency by gender of respondents

The last of the presented figures shows the relationship between stimulus and accompanying persons during the exercise (Fig. 11).

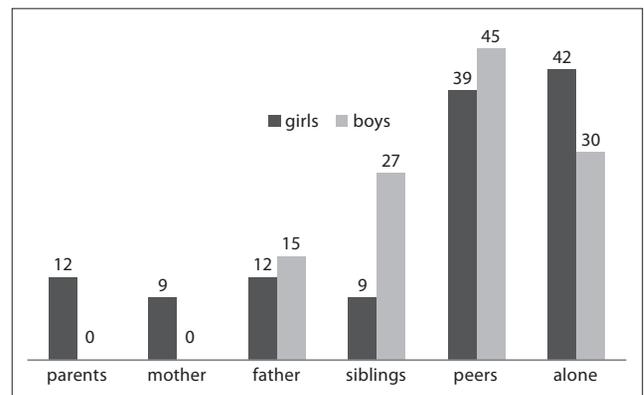


Figure 11. Analysis of distribution of accompanying persons while performing exercise

DISCUSSION

The study group comprised middle school students aged 14-15, and the number participating in the study boys (n=117) and girls (n=123) was comparable, which created the possibility of analyzing the results by gender of the respondents. With the unification of the study group in which as much as 98.75% had siblings, and only 6 children came from incomplete families, it was possible to analyze the family relationships and their possible impact on the development of neurosis, and the family involvement in spending time performing physical activity.

Currently, it is believed that 5-10% of the population of children suffer from anxiety disorders. Research indicates that children under the age of 7 often show an anxiety disorder, while in adolescents aged 15-18, the number of different anxiety disorders increases. It is a noteworthy fact that this type of disorder observed in children is often also diagnosed in their parents [8, 9]. As indicated by Florkowski and Dietrich-Muszalska, difficult family situations, radical changes and brawls often cause anxiety in children. Lack of

ability to talk to a child and resolve conflicts, as well as the attitude of parents to punish and control a child, are the most common causes of anxiety [10].

Many authors indicate that one of the main reasons for the development of child anxiety is a disturbed family relationship [11]. The presented study shows that nearly 75% of the children did not have an emotional bond with their siblings, or there were conflicts between them. A performance analysis of parent-child relationship indicated that 25% of respondents did not have proper relations with their parents, which may indicate the occurrence of anxiety in this group before school. Another important group of adults who may cause changes in children with an anxiety neurosis, are teachers. Unusual behaviour by a student during a call for responses, such as shaking hands, stuttering, aggression, inverting head, wandering eyes, headache, and sudden need to go to the toilet, can be confused with bad behaviour or disobedience. Teachers who are unaware of this and do not carefully observe their pupils may not realize that they are dealing with stress response. By reprimanding the child in front of the whole class and giving low school rating can exacerbate anxiety in that child [12, 13].

There are numerous somatic and emotional symptoms of neurotic disorders and fear of school. According to the latest data, these symptoms are stronger and more common in girls. The idea of staying in school often produces in children somatic symptoms, such as tremors, nausea, hearing rate, sweating hands, or need of an emergency exit to the toilet [14, 15, 16, 17]. According to the data obtained for the presented study, 61% of respondents stated the above-mentioned somatic symptoms, and 59% also felt emotional disorders related to sleep disturbance, difficulty in falling asleep, and morning fatigue and irritability.

Sleep disorders are also typical for people who have low physical activity or stay indoors for long periods of time [18, 19]. Several studies conducted in both Polish and foreign institutions point to the positive effect of physical exercise on the human body. Particular importance is attributed to regular physical activity in children. Physical exercise is necessary to achieve mental balance and combat stress. The lack of physical activity may lead to deterioration of motor coordination, decrease in sleep quality, the emergence of anxiety and depression [20]. Physical exercise affects the release of endorphins ('happy hormones') that positively affect people's perception of themselves and the world around them. A significantly higher self-esteem is observed in all children who play sports [21]. Physical activity is one way of shaping personality traits, such as orderliness, duty, sacrifice and empathy. A particularly big impact of physical activity on the psyche is found in children because it perfectly uses excess energy, and teaches them to cooperate with others. Exercise can positively shape the psyche and affect the quality of life [22, 23].

A properly selected and individualized exercise causes the body to a series of multi-directional changes which include, among others, changes in the work of the organs and body systems, and improvement in mental health. When physical activity is performed, the processes of adapting the organs and systems in the human body for increased motor activity are manifested in many ways. Rostad and Long base their reports on the thermal hypothesis. They demonstrated that an increase in body temperature to 40°C during intense exercise reduces muscle tension and, in consequence, lowers

psychological tension. At the same time, these studies showed similar effectiveness of treatments, such as sauna or hot baths in which similar increases in body temperature are obtained [24]. Although based on Yeung's research, it seems very likely that it is not the increase in body temperature, but in brain temperature that has a beneficial effect on reducing anxiety symptoms [25].

It is important to respect several principles for maximizing the positive impact of activity in mental disorders [26]. When laying a plan of exercise it is crucial to diversify its form. Research shows that the most effective are activities like: running, walking, cycling, playing tennis and playing basketball. It should be noted that physical activities in children with neuroses or other mental disorders should not include an element of competition. Losing in sports may cause excessive anxiety or contribute to a pathological patterns and the appearance of a neurosis. According to own research and observations, children in general do not practice sports. The only form of physical activity for up to 44% of respondents was during physical education classes conducted in the school. However, school activities often rely on the formation of some skills, and are organized in the form of various types of competition.

Taylor's research has shown that in a small way exercise reduces anxiety; however, it also demonstrated that properly selected training reduces anxiety, and some characteristics of a single session of exercise may be appropriately selected to minimize the symptoms of anxiety. Moreover, he demonstrated that the use of physical exercise sessions leads to a reduction of anxiety and stress only in the case of proper understanding of the sociological causes of anxiety [27]. Research conducted by Biddle shows the impact of exercise on emotional disorders and mood. They showed that the used system of exercise caused an increase in energy, decrease in tension and fatigue, and a positive contribution to the easing of anger in patients. It also proved the relationship between the applied exercise and mental 'welfare'. At the same time, he pointed out that physical activity resulted in a long-lasting effect only in the exercise groups in which the goal was clearly defined and focused on the individual needs of people with mood disorders [28].

Own research indicates that respondents have different preferences regarding the type of sport practiced. This is in agreement with the Taylor and Biddle theory, who stress that only the individual selection of physical activity can have the effect of minimizing the impact on anxiety, and build appropriate relationships with other people. The results indicate that 65% of respondents prefer activities like riding a bike, roller skating, dancing, swimming, aerobics and fitness classes. It is worth noting that all the most frequently mentioned activities may be conducted with the participation of other persons, and their cultivation in the group does not contain an element of competition, but rather treated rather as company. Another interesting report has been published by Fox who studied the effects of physical exercise on self-esteem. His findings suggest that exercise can be used as a means of enhancing self-esteem and affect change in the perception of body image. Used regularly, exercise improves the perception of control and self-esteem and contributes to a good feeling of the exercising person. Fox has shown that exercise can be used in all age groups and has no significant difference between the effects on the male and female genders. Due to the large variability in children's self-assessment, using

exercises to increase the effectiveness of self-assessment requires further study. The greatest improvement in self-esteem was observed in patients undergoing aerobic training and strength training, but both types of training showed the greatest effectiveness in the short-term [29].

Further research is required to assess the impact of various forms of physical activity for people suffering from school anxiety and neurosis. The use of less traditional forms of treatment, such as acupuncture and relaxation, are noteworthy. Studies on the effects of acupressure on neurotic disorders in children have been conducted in Russia. The study involved 163 children with anxiety, and it was shown that acupuncture and acupressure combined with traditional medical therapy is an effective method in reducing anxiety behaviours through a positive impact on the functioning of the autonomic nervous system [30].

According to the presented study, 6% of respondents preferred exercises in a relaxation form, and in the literature a lot of space is devoted to the role of relaxation in the treatment of anxiety and neuroses [31]. One of the most popular and easiest to execute is the Jacobson training which consists of a suitable tensioning and loosening of the muscles in such a way as to restore their proper operation. The purpose of this training is to acquire skills of such muscular response, which prevents tension. Jacobson's training is very useful in the prevention of anxiety disorders and psychosomatic disorders. The biggest advantage of this technique is that it helps to evolve self-consciousness. A person with anxiety must closely monitor body reaction in critical situations, and then react accordingly to prevent the onset of symptoms [32].

CONCLUSIONS

Anxiety disorders appear to be a most frequent problem in children and adolescents. One of the main reasons for the development of somatic and emotional disturbances in young people seems to be irregular family and school relationships. The symptoms of neurotic disorders and fear of school, such as tremors, increased heart rate, headache, abdominal pains, appetite disorders, sleep disturbances, morning fatigue and irritability, are more strongly expressed and more common in girls. Physical activity plays an important role in the psychological development of children and improves the quality of life. According to own research, only a small percentage of young people declared that they practice sport regularly. The preferred forms of physical activity are cycling, roller skating, dancing, swimming, aerobics and fitness. Gender influences the type and frequency of physical activity, with gymnastics and dancing most often chosen by girls, while boys prefer strength and team sports.

REFERENCES

- Cawley RH. Concepts and classification. In: Russell GFM, Hersov LA. (ed.). *The Neuroses and Personality Disorders*, Cambridge 1983.
- Łapiński M. *Nerwice*. PZWL, Warszawa, 1983.
- Kępiński A. *Psychopatologia nerwic*. Wydawnictwo Literackie, Kraków, 2005.
- Fryers T, Melzer D, Jenkins R, Brugha T. The distribution of the common mental disorders: social inequalities in Europe. *CPEMH*. 2005; 1: 14-22.
- Hornej K. *Nasze wewnętrzne konflikty*. Dom Wydawniczy Rebis, Poznań, 1994.
- King NJ, Bernstein GA. School refusal in children and adolescents: a review of the past 10 years. *J Am Acad Child Adolesc Psychiatry*. 2001; 40(2): 197-205.
- Witkowska A, Jabłoński S. Co to jest fobia szkolna? *Edukacja i Dialog*. 1999; 2: 44-50.
- McLaughlin KA, Behar E, Borkovec T. Family history of psychological problems in generalized anxiety disorder. *J Clin Psychol*. 2005; 64(7): 905-918.
- Mancini C, Ameringen M, Szatmari P. A high-risk pilot study of the children of adults with social phobia. *J Am Acad Child Adolesc Psychiatry*. 1996; 35: 1511-1517.
- Florkowski A, Dietrich-Muszalska A. Analiza rozpoznawczych u dzieci z objawami lęku. *Psychiatr Pol*. 1995; 2: 175-180.
- Bögels S, Brechman-Toussaint M. Family issues in child anxiety: attachment, family functioning, parental rearing and beliefs. *Clin Psychol Rev*. 2006; 26: 834-856.
- Bristol RC. History of a childhood neurosis and its relation to the adult superego. *Psychoanal Inq*. 2004; 24(2): 286-308.
- Talik E. Specyfika stresu szkolnego i strategie radzenia sobie z nim przez młodzież w okresie dorastania. *Horyzonty Psychologii*. 2011; 1(1): 127-137.
- Rao PA, Beidel DC, Turner SM, Ammerman RT, Crosby LE, Sallee FR. Social anxiety disorder in childhood and adolescence: descriptive psychopathology. *Behav Res Ther*. 2007; 45(6): 1181-1191.
- Beidel DC, Fink CM, Turner SM. Stability of anxious symptomatology in children. *J Abnorm Child Psychol*. 1996; 24(30): 257-269.
- Schmitz J, Blechert J, Krämer M, Asbrand J, Tuschen-Caffier B. Biased perception and interpretation of bodily anxiety symptoms in childhood social anxiety. *J Clin Child Adolesc Psychol*. 2012; 41(1): 92-102.
- Beiser HR. Symptomatic disturbances and clinical manifestations of neurosis in children and adolescents. In: Etezady MH. (ed.). *The Neurotic Child and Adolescent*, Jason Aronson Inc., Northvale 1990.
- Stein MA, Mendelsohn J, Obermeyer WH. Sleep and behavior problems in school-aged children. *Pediatrics*. 2001; 107(4): E60.
- Watenpaugh DE. The role of sleep dysfunction in physical inactivity and its relationship to obesity. *Curr Sports Med Rep*. 2009; 8(6): 331-338.
- Ströhle A. Physical activity, exercise, depression and anxiety disorders. *J Neural Transm*. 2009; 116: 777-784.
- Tremblay MS, Inman JW, Willms JD. The relationship between physical activity, self-esteem and academic achievement in 12-year-old children. *Pediatr Exerc Sci*. 2000; 12: 312-323.
- Stathopoulou G, Powers MB, Berry AC, Smits JAJ, Otto MW. Exercise interventions for mental health: a quantitative and qualitative review. 2006; 13(2): 179-193.
- Górski J. *Fizjologiczne podstawy wysiłku fizycznego*. PZWL, Warszawa, 2006.
- Rostad FG, Long BC. Exercise as a coping strategy for stress. *Int J Sport Psychol*. 1996; 27: 197-222.
- Yeung RR. The acute effects of exercise on mood state. *J Psychosom Res*. 1996; 40: 123-141.
- Paluska SA, Schwenk TL. Physical activity and mental health: current concepts. *Sports Med*. 2000; 29(3): 167-180.
- Taylor AH. Physical activity, anxiety and stress. In: Biddle SJH, Fox KR, Boutcher SH. (ed.). *Physical Activity and Psychological Well-being*, Routledge, London 2000. p. 10-45.
- Biddle SJH. Emotion, mood and physical activity. In: Biddle SJH, Fox KR, Boutcher SH. (ed.). *Physical Activity and Psychological Well-being*, Routledge, London 2000. p. 63-87.
- Fox KR. The effects of exercise on self-perception and self-esteem. In: Biddle SJH, Fox KR, Boutcher SH. (ed.). *Physical Activity and Psychological Well-being*, Routledge, London 2000. p. 88-117.
- Goïdenko VS, Komarova IB. Efficacy of acupressure therapy in combined treatment of psycho-autonomic neurotic disorders in children. *Zh Nevrol Psikhiatr Im S S Korsakova*. 2003; 103(8): 23-28.
- Arntz A. Cognitive therapy versus applied relaxation as treatment of generalized anxiety disorder. *Behav Res Ther*. 2003; 41(6): 633-646.
- Conrad A, Roth WT. Muscle relaxation therapy for anxiety disorders: it works but how? *J Anxiety Disord*. 2007; 21(3): 243-264.