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Resilience and Computer Addiction of Adolescents with Musculoskeletal Disorders

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Abstract

Adolescents with musculoskeletal disorders are reported to experience difficulties in building relationships with peers, poorly adapt in a team, which contributes to their escape from life's difficulties into the virtual world and the gradual formation of computer addiction. With computer addiction, a child may have increased irritability, a tendency to illegal actions, which leads to a hostile perception of the surrounding social world. Their ability to express their thoughts, establish contacts and dialogues with other people in real life suffers. Against the background of social maladjustment with excessive enthusiasm for games, some schoolchildren develop unjustified aggression, cruelty; most of them do not know how to productively overcome difficulties. The purpose of the research is to identify the characteristics of resilience in adolescents with musculoskeletal disorders with different levels of computer addiction. The following diagnostic methods were used in the study: S. Maddi's Hardiness Survey (adapted by D. A. Leontiev, E. I. Rasskazova), Internet addiction test (T. A. Nikitina, A. Yu. Egorov). The sample comprised 30 participants. The data was analyzed using the methods of mathematical data processing (nonparametric statistical Kruskal-Wallis test, Spearman's rank correlation coefficient). Research results showed that adolescents with musculoskeletal disorders are characterized by a lower level of resilience. They are willing to show more passive behavior and avoid stressful situations.

Keywords: resilience, computer addiction, adolescents, musculoskeletal disorders

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Introduction

Movement and displacement in space are one of the most important human functions. With all the variety of congenital and acquired diseases and injuries of the musculoskeletal system, most adolescents have similar psychological problems such as limited activity, emotional sufferings due to pain, and the impossibility of full-fledged communication (Khazova, 2013; Tokarskaya, Tenkacheva, & Tomilova, 2019). This way, the quality of life gradually decreases (Antonova, 2020). Sufferings experienced by adolescents cause anxiety, social maladjustment, a decrease in the ability to overcome difficult life situations. Adolescents with musculoskeletal disorders (MSD) were reported to not know how to build relationships with peers and poorly adapt in a team due to the lack of social experience and interaction with others. This contributes to the escape from life's difficulties into the virtual world of the computer and the gradual formation of computer addiction. Against the background of excessive enthusiasm for computer games, adolescents become unable to create their visual images; they experience emotional immaturity, irresponsibility, and the effectiveness of some types of memory decreases (Khazova, 2013). The dimension of computer addiction is not the time spent at the computer but the concentration of all the interests of the child around the computer. Adolescence is one of the most favorable periods for the development of resilient personality traits, which can help in the process of overcoming various life difficulties, to control and manage life events, perceive difficulties as valuable experiences and successfully cope with them, using them as an opportunity for personal growth (Tokarskaya et al., 2019). In this regard, the problem of adolescents' resilience is becoming especially relevant at present. The counteraction of the child's personality to computer addiction is determined by the formation of the components of resilience, which allows the person, especially an adolescent with MSD, to actively and constructively behave in different life situations.

Purpose and objectives of the study

The aim of the study is to identify the features of resilience in adolescents with disorders of the musculoskeletal system with different levels of computer addiction. The objectives of the study are to 1) reveal the general level and severity of the parameters of resilience in adolescents with disorders of the musculoskeletal system; 2) determine the presence or absence, as well as the specifics of computer addiction in adolescents with MSD.

Literature review

The term resilience (hardiness) was introduced at the end of the 20th century by American psychologists Susan Kobeisa and Salvator Maddi (Maddi & Khoshaba, 1994) and was initially considered from the point of view of the theoretical provisions of existential psychology and stress psychology. The researchers considered endurance as a special integrative quality, the system of attitudes and beliefs about the world and about oneself, which allows a person to withstand a stressful situation while maintaining internal balance and harmony. Further, Maddi (Maddi & Khoshaba, 1994) developed a model of resilience as a person's beliefs that allow remaining active and preventing the negative consequences of stress (Leontiev & Rasskazova, 2011). Leontiev (2014) analyzed the phenomenon of resilience against the background of the formation of individual personal structures. The author states that resilience is the system of beliefs about oneself, about the world, about relationships with the world. It includes three relatively autonomous components: involvement, control, and risk-taking. Resilient people are known to possess all three of these qualities. However, in real-life situations, the components of resilience can manifest themselves to varying degrees in different situations.

This study drew on the works of Leontiev & Rasskazova (2011), where, among other things, the development and testing of the Russian-language version of S. Muddy's resilience test are described.

Some aspects of personal resilience were studied in the Russian psychology on the example of adolescents with MSD (Gorkova & Miklyaeva, 2019; Tokarskaya et al., 2019), adolescents with personal helplessness and independence (Tsiring, 2009), resilience and socio-psychological adaptation of adolescents with different life scenarios (Ivanova, 2013).

The literature review shows that in recent years, studies of various factors of the resilience of adolescents appeared in Russian science. As an integrative characteristic of a person responsible for success in overcoming various life difficulties, adolescent resilience in the process of formation is subject to various social influences. One of the most relevant aspects of the modern teenager's life is the presence of a digital environment (Soldatova & Teslavskaya, 2017). Online and mixed reality provides teenagers with real opportunities and illusions of their development, significance, success, or failure. For adolescents with MSD, the digital environment can be, if not the only, a very significant platform for socialization, influencing their overall level of resilience. In this regard, the study of the resilience of adolescents with a violation of the musculoskeletal system with different levels of computer addiction deems relevant.

Methodology

The research is guided by the principles of consistency, objectivity, and dynamism (Zagvyazinsky, 2010). The following diagnostic methods were used in the study: S. Maddi's Hardiness Test (Leontiev & Rasskazova, 2006); Internet addiction test (Egorov, Kuznetsova, & Petrova, 2005). These methods allow studying certain parameters of the resilience and computer addiction of adolescents in accordance with the objectives of the study. The total sample size was 30 high school students in Sochi. The experimental group consisted of 15 adolescents with MSD; the control group – 15 adolescents without MSD. The age of adolescents was from 12 to 14 years. The study was carried out with the written consent of the legal representatives of minors and with the approval of the ethics committee of the research organization – Sochi State University (№ 01-2/1478). The data were analyzed using the methods of mathematical data processing (nonparametric statistical Kruskal-Wallis test, Spearman's rank correlation coefficient).

Results

At the first stage of the research, we studied the parameters of computer addiction and resilience of adolescents in the experimental and control groups. The values of the components and the level of adolescents' resilience were studied with the help of the test of resilience in the adaptation by D. A. Leontiev and E. I. Rasskazova (Leontiev & Rasskazova, 2006). The results that were obtained for each of the methods were analyzed separately. Table 1 presents the analysis of the average values for the components of viability and the general indicator in the control and experimental groups.

Table 1. Average values for the components of viability and the general indicator in the control and experimental groups

Scales	Experimental group		Control group	
	\bar{X}	σ	\bar{X}	σ
Engagement	16,2	1,75	35,8	4,16
Control	15,7	1,64	21,25	4,58
Risk-taking	8,1	0,88	19,1	3,17
General indicator of resilience	36,5	2,42	81,45	9,59

The data presented in Table 1 shows that the average values for the components in the group of adolescents in the control group exceed the average values for the components in the group of adolescents with MSD. Thus, the indicator of the engagement of adolescents in the control group is 19.6 points higher than the indicator of the engagement of adolescents with MSD. The indicator on the “control” scale is 5.5 points higher; on the scale of risk-taking – 11 points higher. The largest discrepancy in the average values is observed in the case of such components as engagement and risk-taking, and the smallest discrepancy – in the case of the component “control”. The average indicators of engagement, control, and risk-taking in the group of adolescents with MSD are at a low level.

Adolescents in the control group scored high on the indicators of engagement, control, and risk-taking.

The obtained data on the components of resilience showed that the average values for all scales and the general indicator of resilience in the group of adolescents with MSD are significantly lower than in the control group; the greatest discrepancy in the average values in the group of adolescents with MSD is observed on the scale of engagement, and the least on the scale of risk-taking.

Next, we defined whether the revealed differences are statistically significant by running the Kruskal-Wallis statistical test. The empirical data obtained are shown in Table 2.

Table 2. Statistical significance of the differences in the average indicators for individual scales and the general level of resilience in the control and experimental groups

Scales	Engagement	Control	Risk-taking	General level of resilience
Criterion value	19,446	2,250	19,657	19,446
Significance level of differences	0,000	0,134	0,000	0,000

Statistical analysis revealed significant differences between the groups in terms of the scales of engagement and risk-taking, as well as in the general indicator of resilience. According to such an indicator of resilience as control, there were no statistically significant differences between the experimental and control groups ($p = 0,134$).

At the second stage of the study, the hypothesis about the presence of specificity in the manifestation of computer addiction in adolescents with MSD was tested. Based on the results obtained on the Internet addiction test (Egorov et al., 2005), it can be seen that the group of adolescents with MSD has a higher Internet addiction rate of 16.75 points than adolescents in the control group with 15.5 points. Also, the smallest indicator of the state of the norm is characteristic of the control group with 5.53 points, when the indicator is within the normal range in adolescents with MSD is 8 points (it is closer to the upper limit of the norm).

Discussion

The research results showed low engagement rates in the group of adolescents with MSD. This indicates their lack of self-confidence and low involvement in ongoing events meaning that they have difficulties in self-realization, in opportunities to independently find something interesting for the development of personality.

The revealed low indicators on the scale of control in the group of adolescents with MSD indicate their conviction in own helplessness, inability, the senselessness of the struggle to achieve success, and the feeling of impossibility to influence fate. In the group of adolescents in the control group, on the contrary, high indicators on the control scale were recorded, which suggests that adolescents without disorders of the musculoskeletal system are ready to fight to achieve a result, even if success is not guaranteed, they strive for an independent choice of their activities and their own paths.

Low indicators on the scale of risk-taking in the group of adolescents with MSD indicate that adolescents in this group do not believe that all events in life can bring the necessary experience to achieve their goals and overcome difficulties. In the control group, the indicators of the risk-taking component are at a high level. This shows that the active development of the personality of adolescents in this group occurs due to the successful assimilation of life experience and its subsequent application. They are accepted for solving the assigned tasks with great desire and confidence in their abilities.

The sum of the results for all components of engagement, control, and risk-taking outlines the concept of human resilience. The normal indicators of resilience are in the range of 62.19-99.25 points; the average indicators of the resilience of adolescents with MSD are reduced and are in the range of 36.5 points, whereas the average indicator of resilience of adolescents in the control group inclines towards high values and is 81.45 points. This suggests that adolescents with MSD find it difficult to cope with stressful situations and overcome difficulties. Due to the reduced resilience indicators of adolescents with impaired development, each stressful situation is perceived as more traumatic, due to which tension and stress develop into chronic diseases and leads to psychosomatic diseases.

The statistical analysis of the results obtained allows asserting that adolescents with MSD, in contrast to adolescents in the control group, are characterized by lower resilience and unexpressed components of engagement and risk-taking. Perhaps, these differences are associated with the small life experience of adolescents with MSD in overcoming difficulties, their lack of certain strategies of behavior in relation to peers and adults, low engagement in social life and an incompletely formed belief that everything that happens has a positive influence on personality development and obtaining experience. The consequence of this, we believe, may be further psychological instability of adolescents with disorders of the musculoskeletal system. Such adolescents may avoid taking responsibility for events happening to them; they may have a poorly developed structure of ideas about themselves and self-awareness. They are more likely to be characterized by a pessimistic attitude and they will tend to avoid contact with other people, will have low motivation to develop in society.

The adolescents in the control group, as it turned out, are more persistent and are convinced that their efforts can have an impact on different events, they have a greater inclination to be involved and interested in the ongoing events. That is, they are involved in everyday life and get more pleasure from their own activities; they are more effectively involved in solving various life problems. They have a more developed ability to use external resources, such as physiological and typological personality traits, cognitive processes and personal qualities, social support, acquired knowledge, skills and experience, in vital situations.

The study tested the working hypothesis that adolescents with MSD are more prone to a tendency to go into virtual reality because there, they have equal opportunities for self-expression and this gives them the opportunity to communicate on an equal footing with all participants in the communication process, their difficulties with spatial movement are erased. The difference, which is obvious between adolescents in the real world, is hidden in the virtual environment, and adolescents with MSD do not hesitate to express themselves.

However, the statistical analysis of the results obtained by the parameters of computer addiction showed that there were no significant differences between the groups. Adolescents, regardless of the presence of a defect, are prone to the formation of computer addiction.

Conclusion

Summing up this study, we can conclude that adolescents with MSD are characterized by lower resilience than adolescents in the control group.

Adolescents with impaired development are more inclined to think that struggle, exertion of effort, active assimilation of knowledge acquired through experience does not allow influencing the result of what is happening and does not contribute to overcoming difficult situations in life; they are prone to more passive behavior and avoidance of stressful situations. Thus, our first hypothesis was confirmed.

In the Internet environment, everyone has equal opportunities for self-expression, as well as the opportunity to communicate on an equal footing with all participants of the communication process; all the difficulties of spatial movement are erased. In virtual reality, communication is devoid of many verbal and non-verbal components. The Internet environment is not colored by emotions; there are no facial expressions and gestures. The difference that exists between adolescents in the virtual environment is hidden, and children are not ashamed of their defects. However, with all this, we did not find statistically significant differences in the degree of inclination to computer addiction between adolescents with MSD and adolescents in the control group. That is, our second hypothesis was not confirmed.

Adolescents with MSD do not have any peculiarities of manifestation of levels of computer addiction in comparison with adolescents in the control group.

As a result of the correlation analysis, negative links were established between the resilience and the level of computer addiction in all its components. Adolescents, regardless of the presence of a defect and gender, are characterized by a tendency to computer addiction with a decrease in the level of resilience and its components: engagement, control, and risk-taking.

Socially useful, socially approved activity, which includes such activities as educational, cognitive, labor, organizational, social, and creative is leading in adolescence. The main thing is that adolescents should feel a sense of their own significance and the importance of the activity they perform. Recognition of the value and significance of one's own personality is one of the basic needs of adolescence. Taking into account the leading type of activity of adolescence, we are talking about constructive behavior, self-affirmation through the desire to stand out with their abilities and skills, and the desire to achieve these abilities and skills.

Resilience in terms of our work is viewed as the ability to plan our activities, the determination to act actively, the confidence in the ability to influence the situation and the willingness to take responsibility, and as a consequence, as the main personal resource or potential that helps to overcome life difficulties, perceive difficulties as a valuable experience and successfully deal with them, using them as an opportunity for personal growth. The resilience of an individual is characterized by the ability to overcome difficulties and is an internal resource that feeds a person's desire for self-realization, the manifestation of own uniqueness, self-affirmation, as its basic manifestation.

In fact, adolescents' resilience and propensity to computer addiction are interrelated. With a decrease in self-confidence, in the ability to influence the situation and overcome stress and to receive approval from peers and relatives, a great desire to avoid unpleasant sensations and to get away from such a traumatic situation appears in the adolescent. As a result, teenagers go to the virtual world. To prevent such a situation, adults need to stimulate the solution of everyday tasks by the child from early childhood, independence should be encouraged, it is necessary to develop cognitive abilities, control over self-regulation, and stimulate the child's motivation. It is also necessary to carry out all preventive measures to prevent computer addiction.

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Competing interests

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