

Evaluation of the Main Problems of Adaptive Chess Sport in Russia

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Abstract

Adaptive chess sport can strongly stimulate the vitality of the patients and preserve their existing psychophysical potential through the exercise of creative and mental abilities. The effect of adaptive chess is based on the satisfaction of the psychophysical needs of those with weakened health, but preserved cognitive capabilities of the brain. Comparing the results of a questionnaire among middle-aged and elderly chess players with musculoskeletal problems in Moscow revealed a number of problems in the organization of adaptive chess sports. The most important problems were a reduction in the number of sports institutions of additional education and difficulties with the formation of the coaching staff in adaptive chess. The conducted research showed the high efficiency of regular chess trainings in terms of stimulating the chess player's body. Even subjects in the control group showed an increase in the effectiveness of playing chess by 43% in the first group and 93.5% in the second group compared to the preliminary stage of the study.

Keywords: Adaptive sports, Chess, Cerebral palsy, Problems of sports development, Training

Introduction

The health improvement of various categories of sick and disabled people is largely ensured in Russia by a system of state support measures, which creates opportunities for them to participate in social life like healthy people (Fayzullina *et al.*, 2020). Active options for its application are very important in the system of these measures for sick and aging citizens (Karpov *et al.*, 2021a; Zavalishina *et al.*, 2021a). Many elderly people and those with disabilities are unable to lead an active lifestyle (Abdelbasset *et al.*, 2020; Hamadeh *et al.*, 2020). For this reason, the importance of adaptive physical culture and adaptive sports increases (Karpov *et al.*, 2020a; Zavalishina, 2020a). A special place in them belongs to chess related to abstract game sports, the result of which is associated not with the athlete's motor activity,

but with the effectiveness of mental activity (Mikhaylova, 2019).

In the course of using chess for the purpose of social and physical rehabilitation of disabled people, it is especially important that it lacks motor activity (Vorobyeva *et al.*, 2018). In addition, chess is very important for optimizing leisure time, meeting communication needs, diversifying personality development, and expanding its communicative capabilities. The content of this adaptive sport is, first of all, in the formation of sportsmanship among disabled people and their achievement of good results among people with comparable health problems (Zavalishina *et al.*, 2021b). In addition, with the help of adaptive sports, it is possible to maximize the development of a sick person's viability, preserve his/her psychophysical state at a sufficient level, giving each person the opportunity to realize his/her reserves (Zavalishina, 2018; Karpov *et al.*, 2021b).

The effect of practicing chess as an adaptive sport is based on the satisfaction of the psychophysical needs of those with weakened health, but with a large volume of cognitive capabilities of the brain. For the further successful development of this kind of adaptive sport, it is necessary to identify the main problems of its organizational aspect at the present stage. This will make it possible to achieve a clear understanding of them and get closer to the possibility of their elimination.

Purpose

To identify the main problems of adaptive chess in Russia.

Materials and Methods

The scientific research was carried out in the conditions of the centers of social services for the population "Aleksievsky" and "Yuzhnoportovy" in Moscow. A survey was carried out on 105 people (19-29 years old) involved in chess for recreational purposes. All these people had cerebral palsy. Also, 106 people (60-74 years old) were examined who were representatives of mass chess sports.

The examination of all those taken under observation was carried out at the stage preceding the experiment, directly during the experiment, and at the control stage at the end of the experimental stage. At each of the three stages of the experiment (preliminary, experimental, and control), 4 series of examinations were performed (every 3 months). These surveys made it possible to

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draw up a picture of the dynamics of changes in the indicators taken into account throughout the year.

During each study, questionnaires and tests were used to identify difficulties in mastering chess. The surveyed subjects were tested to evaluate the effectiveness of mastering game skills.

Statistical analysis of the results was carried out using correlation analysis and Student's t-test. The calculation of the Student's coefficient was carried out according to the formula for testing the null hypothesis:

$$T = \frac{X_1 - X_2}{\sqrt{(m_1^2 + m_2^2)}} \quad (1)$$

Taking into account the sample size and the observed groups, the degrees of freedom (f) was calculated using the formula:

$$f = 2n - 2 \quad (2)$$

Results and Discussion

A parallel questionnaire was conducted for both groups of participants. The data obtained were combined into pairs of correlation Pleiades for two observation groups.

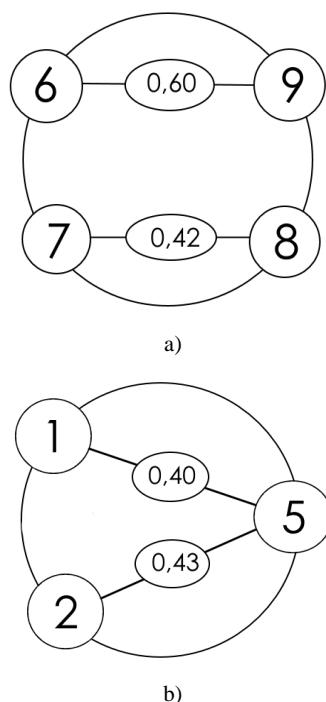


Figure 1. Correlation constellations of difficulties identified by the respondents of the first group

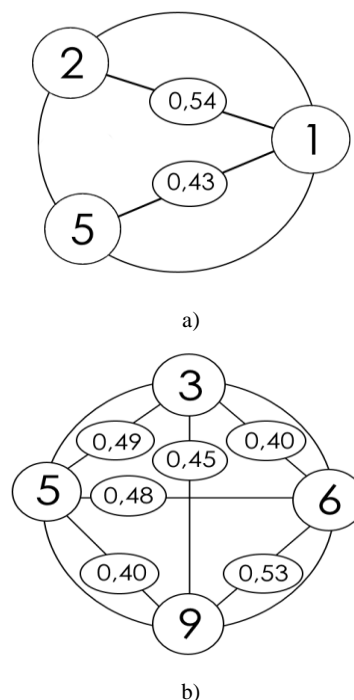


Figure 2. Correlation constellations of difficulties identified by the respondents of the second group

As can be seen from **Figures 1 and 2**, the first constellation of the first group is formed by two conjugated low-power (power 2) pleiads in the form of a "chain": the first of which, having the greatest strength ($p = 0.60$), reflects the problems of informing and recruiting the coaching staff (No. 6,9); and the second (strength $p = 0.42$) - the problems of organizing the competitive process (No. 7) and informing about the benefits of its passage (No. 8).

The results of the first group also form a second, less strong ($p = 0.42$) galaxy (power 3, "star" shape), formed by the signs of "insufficient number of sports schools" (No. 5), "difficulty in transporting chess players" (No. 1), and "insufficient elaboration of methods taking into account nosologies" (No. 2). Based on this, it can be concluded that some problems persist in mass chess in Moscow.

Analyzing the research results in the first group of participants, it can be noted that the high significance of factors No. 6 ("Insufficient number of coaches in adaptive chess"), No. 9 ("Lack of available information on the development of adaptive chess in the media"), and No. 5 ("Insufficient the number of sports schools") testifies to the negative dynamics of the sports staff and educational and training base. The presence of a correlation connection between features 7 and 8 can be interpreted as a consequence of insufficient information illumination of adaptive chess, which reduces the health-improving and competitive potential of adaptive chess.

The results of the second group of questionnaires in the first group confirmed the presence of a significant connection between

difficulties No. 1, 2, and 5 ("insufficient number of sports schools" (No. 5), "difficulty in transporting chess players" (No. 1), "insufficient study of methods taking into account nosologies" (No. 2)). However, in the second group, the central feature was the difficulty with transportation to the training bases (no. 1) so that signs no. 2 and 5 lost a pronounced relationship. At the same time, points No. 1 and 2 in the opinion of the respondents of the second group are interconnected. The average correlation coefficient (strength) of the constellation of the second group (power 3, "star" shape) was 16.7% higher than in the first and amounted to 0.49. This indicated that for representatives of mass chess sports, the problems of organizing the process of adaptive sports training seem to be more relevant than for people undergoing sports and health training.

The second constellation of results of the second group was more powerful (power 4 units) but had a lower average correlation coefficient (strength 0.46) and had the shape of a "network". This galaxy has shown the lack of information coverage in Russia of the adaptive chess training process. This meant the lack of information about existing chess clubs, sections, and clubs (No. 3), a small number of references to the development of adaptive chess in the media (No. 9), insufficient number of adaptive chess coaches and sports schools (No. 5,6).

Comparison of the results of the questionnaire survey of the second constellation of the second group with the results of the first group revealed a decrease in the correlation between factors 6 and 9 ("Insufficient number of adaptive chess coaches" and "Lack of available information on the development of adaptive chess in the media") by 11.7%. That is, in the opinion of representatives, these problems had a less pronounced relationship. At the same time, new relationships appeared between factors 3, 5, 6, 9, which confirmed the development of a negative situation in the coverage of adaptive chess and the results of the first group, indicating the emerging crisis of the educational system of adaptive chess.

Based on the results the graph "Confidence coefficient change" (Figure 3), starting from the second "slice", it could be seen that the Student's t-test exceeded its critical value ($t_{critical} = 1.98$) in accordance with the calculated number of degrees of freedom f and the required level of significance p (at $f_1 = 208$; $f_2 = 210$; $p \leq 0.05$ in both groups).

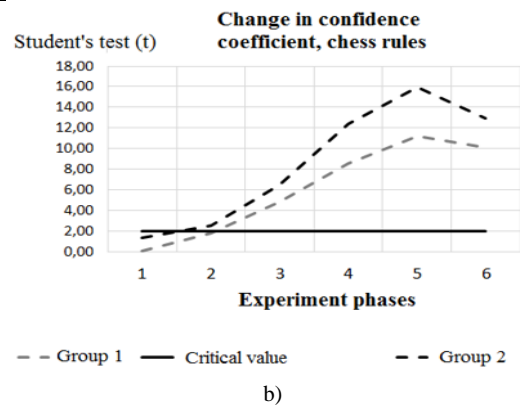
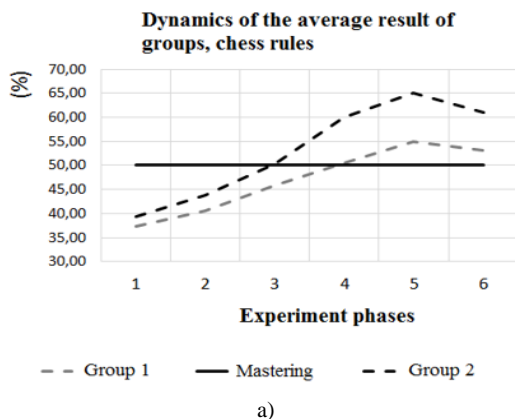


Figure 3. Change in confidence coefficient/Dynamics of the group's average result in mastering chess rules

Since the results of the study, lying within the confidence interval, are statistically significant at a significance level of $p \leq 0.05$, already from the second slice of the preliminary stage of testing up to the end of the experiment, we can assume with a 95% probability that both groups of chess players will show a gradual improvement in results in the level of chess mastery (Figure 4).

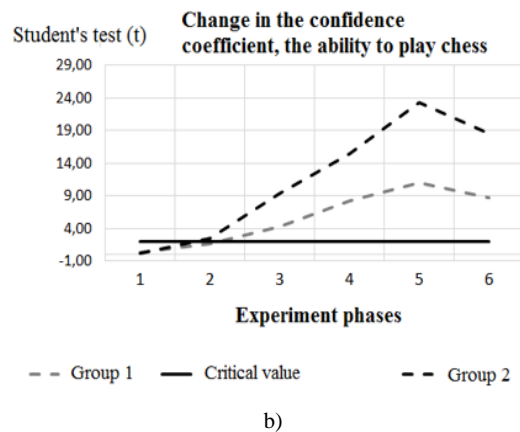
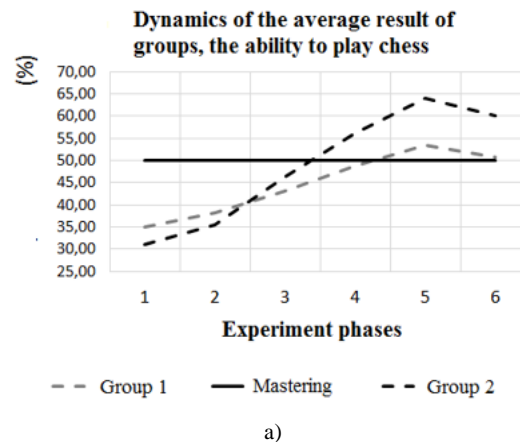


Figure 4. Change in confidence coefficient/Dynamics of the group's average result in the ability to play chess

Analyzing the dynamics of the average results of the subjects in the chess tests, one can note a general tendency towards an

increase in indicators at the preliminary stage (1-2 "slice") and during learning to play chess (3-4 "slice"). The mastering of the material by the participants of sports and recreational activities occurs already at the 3rd "cut". At the same time, the elderly representatives of the mass chess sport crossed the required level only by the 4th "cut" of the experiment. This is explained by the differentiation in the cognitive abilities of athletes and in their general sports readiness (Bespalov *et al.*, 2018; Zavalishina *et al.*, 2021c).

At the preliminary stage of testing, there was a slight increase in the test subjects' playing skills, on average about 9.7%. In the 1st group, the results in the tests of the "Chess Rules" series by the 2nd "cut" showed an increase of 8.1%, the results in the "Ability to play chess" series increased by 8.6%. In the 2nd group, the results in the tests of the "Chess Rules" series by the 2nd "cut" showed an increase of 10.9%, the results in the "Ability to play chess" series increased by 12.9%.

At the next stage, there was an increase in the level of indicators of subjects of the 2nd group in all series of tests, which averaged about 20.6% at the end of the final stage of testing. The gain of the 1st group was still low with an increase of 13.3%. In group 1, the results in the tests of the "Chess Rules" series to the 4th "slice" showed an increase of 15.0%, the results in the "Ability to play chess" series increased by 11.7%. In group 2, the results in the tests of the "Chess Rules" series to the 4th "slice" showed an increase of 19.9%, the results in the "Ability to play chess" series increased by 21.6%.

The control stage of the study was traditionally carried out after the completion of the training course by the subjects. Zavalishina (2020b) revealed that the level achieved in the mastering of chess skills among the tested decreases, starting from the end of the experimental stage. In the 1st group, the results in the tests of the "Chess Rules" series to the 6th "slice" decreased by 3.6%, the results in the "Ability to play chess" series decreased by 4.8%. In group 2, the results in the tests of the "Chess Rules" series to the 6th "slice" decreased by 6.2%, the results in the "Ability to play chess" series decreased by 6.3%. This should be associated with the cessation of group exercises and the weakening of the involvement of the surveyed in the process of sports training (Karpov *et al.*, 2020b; Vorobyeva *et al.*, 2020).

Conclusion

Comparison of the results of the questionnaire survey among middle-aged chess players with the pathology of the musculoskeletal system and elderly chess players revealed the presence of a number of problems in the organization of adaptive chess sports in Moscow. These include a reduction in the number of sports institutions for additional education, as well as difficulties in the formation of a coaching staff in adaptive chess. Based on the results of the study, we can talk about the high efficiency of the system of regular chess training. Even taking into account the fall at the control stage of the study, the subjects had an increase in the considered indicators of 43% in the first

group and 93.5% in the second compared to the preliminary stage of the study.

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Ethics statement: The study was approved by the local ethics committee of the Russian State Social University on September 15, 2018 (protocol №11).

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