

Formation of the mental component of the personality structure using physical activity

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Abstract

In our research, we studied the influence of systematic physical education and sports on the mental component of the personality structure of female students. The aim of the study was to study the influence of physical activity of sports specialization on the formation of the mental component of the personality. To study the dynamics of the indicators of the mental component of the personality structure, the method of longitudinal observation (for two years) was applied for a group of female students aged 18-24 years using a modified form multifactor personality test based on an adapted questionnaire, which included the study of 11 "leading" qualities: strength "I", purposefulness, initiative, optimism, leadership, fear, kindness, sociability, ability to make efforts, selfishness, aggressiveness. The survey was carried out at the beginning of the 1st and at the end of the 2nd training. Students of the Faculty of Medicine were divided into two groups: control (CG) and experimental (EG). Classes with students from the CG (n = 12) were carried out according to the curriculum of universities of Ukraine, and with students from four EG (n = 12-13 students in each) according to the author's program developed by us, which took into account the sequential system of physical activity (FA) with the use of physical loads (FL) of sports specialization: rhythmic gymnastics (RG), recreational running (RR - 2000 m), basketball and athletic gymnastics (AG). Physical fitness assessment (PF) of female students was carried out with the help of tests: running 100 m; swimming 50 m; torso tilts; standing long jump; running long jump; running 2000 m. Estimation of the average value (in points) of the mental qualities of the personality of female students showed that among female students from the experimental group, the highest values are possessed by such qualities as: strength of "I" – 7.00 ± 0.76 ; kindness – 7.09 ± 0.62 ; purposefulness – 7.33 ± 0.64 ; initiative – 6.19 ± 0.97 , and in the control group the most pronounced quality is kindness (6.70 ± 0.73). The analysis of indicators of manifestation of mental qualities, activity and purposefulness testify in favor of the experimental group students.

Key words: aggressiveness-peacefulness, initiative, help of physical activity, kindness, power of "I", purposefulness.

Introduction

Over the past decade, trends of development of the Ukrainian society made the scientists to direct their eyes to the formation of health components, especially in the younger generation. It should be emphasized that these issues are in the centre of attention of different sciences, e.g.: medicine, hygiene, health care, ecology, pedagogy, psychology, sociology, physical education and others (Mahlovanyy et al., 2010; Apanasenko et al., 2012; Momot et al., 2020).

When discussing the individual components of the personality structure and their interconnection, one should not forget that the human personality itself is their bearers. It is known that "man" is a biological concept, "personality" is a social one (Amosov et al., 1989; Mahlovanyy et al., 2010; Apanasenko et al., 2012; Hansen et al., 2019). These two concepts are indivisible, two-fold, but their total content is more or less different (Buchkovska et al., 2017; Borovynska et al., 2017). However, at the same time, each person is a "person", since he was already born by it; but not every "person" is a "personality", because they are not born with it, but become (Lee et al., 2015; Hrynovets et al., 2020). The modern period of the development of science is characterized by a growing volume of knowledge about man as a biological and social being (Ryff, 1995; Lepri et al., 2016; Guzi et al., 2019). Therefore, any attempt that is aimed at identifying features raises doubts that it is some personality traits that are in a certain way responsible for social and physical activity, as well as the fact that the problem of creating a close relationship between physical and mental components in the formation of a harmoniously developed personality is the most difficult among existing problems (Möttus et al., 2016; Artese et al., 2017; Stepanchenko et al., 2017; Serin, 2018; Nerubasska et al., 2020). In turn, a harmoniously developed personality, a priori, is considered healthy (Dubina et al., 2012; Buchkovska et al., 2017; Momot et al., 2020; Nesterchuk et al., 2020).

The state of health of modern youth is influenced by a number of negative factors: physical inactivity, neuro-emotional and mental stress during the educational process, unhealthy diet, non-optimal ratio of work and rest, environmental conditions, bad habits (Amosov et al., 1989; Libby et al., 2015; Grygus, 2017).

According to the WHO, the following factors shape the health of a modern person: 10% depends on the work of health authorities, 20% on heredity, 20% on environmental factors and 50% on conditions and lifestyle. Thus, human health should be considered as a dynamic process in which health indicators improve or deteriorate depending on the person's lifestyle (Dubina et al., 2012; Wilson et al., 2015; Lavrin et al., 2019; Novopysmennyi et al., 2020).

The influences of physical development, ie "body", on the features of human qualities are well known. Meanwhile, the possible mechanisms and features of such relationships between physical (biological) and mental (personality) human status in many cases are not identified. There is no doubt that some personality traits are in some way responsible for the "inclusion" of the student in the learning process, thereby indirectly influencing his mental and physical activity. Among such basic personality traits are: strength "I", purposefulness, initiative, optimism, ability to effort and more. Therefore, in this report we present the probability of influencing the elements of the personality structure from the outside, through systematic physical culture and sports, which we have studied and considered [Mahlovany et al., 1998; Dubina et al., 2012; Hrynovets V et al., 2020].

Materials and methods

The phenomenon of physical culture in terms of strength and ability to influence the strengthening and preservation of human health is one of the most important, as it causes positive changes in the body. Studies by a number of authors indicate that the choice of means and regulation of physical activity in physical culture and health-improving classes should meet both somatic health and physical fitness of young persons (Apanasenko et al., 2012; Mõttus et al., 2016; Libby et al., 2015; Buchkovska et al., 2017; Diachenko-Bohun et al., 2020).

According to G. Startist's (Mahlovany et al., 1998). definition, "a person who is distinguished by harmonious physical and mental development and is well adapted to the surrounding physical and social environment can be considered healthy" (Amosov et al., 1989; Mahlovany et al., 2010; Dubina et al., 2012; Hearon et al., 2020). It is a healthy person who is able to fully realize his physical and mental abilities and fulfill his social purpose. The concept of personality is one of the most complex, since the personality of a person cannot be covered by any time frame. Recently, much attention has been paid to the study of individual personal qualities and their role in the formation of personality through physical activity. As our previous studies have shown, the absolute values of mental qualities can be different for individuals who do not go in for sports and among athletes (Buchkovska et al., 2013; Mõttus et al., 2015; Wilson et al., 2015; Buchkovska et al., 2017). Thus, the famous American psychologist Brainerd J. Cretti, studying the personality profiles of athletes, found that athletes, in comparison with non-athletes, are more achievement-oriented, independent, aggressive, emotionally stable, self-confident (Bryant, 1995; Mahlovany et al., 1998; Mahlovany et al., 2010; Buchkovska et al., 2017). Therefore, if physical activity is used as a controlling factor for the formation of the mental component of a personality, one can expect an increase in the absolute values of mental qualities. Therefore, in our research, we studied the influence of systematic physical education and sports on the mental component of the personality structure of female students.

The aim of the study was to study the influence of physical activity of sports specialization on the formation of the mental component of the personality.

Results

Research methods and organization. To study the dynamics of the indicators of the mental component of the personality structure, the method of longitudinal observation (for two years) was applied for a group of female students aged 18-24 years using a modified form multifactor personality test based on an adapted questionnaire, which included the study of 11 "leading" qualities: strength "I", purposefulness, initiative, optimism, leadership, fear, kindness, sociability, ability to make efforts, selfishness, aggressiveness. The survey was carried out at the beginning of the 1st and at the end of the 2nd training. Students of the Faculty of Medicine were divided into two groups: control (CG) and experimental (EG). Classes with students from the CG (n = 12) were carried out according to the curriculum of universities of Ukraine, and with students from four EGs (EG1, EG2, EG3, EG4, 12-13 students in each) according to the author's program developed by us, which took into account the sequential system of physical activity (FA) with the use of physical loads (FL) of sports specialization: rhythmic gymnastics (RG), recreational running (RR – 2000 m), basketball and athletic gymnastics (AG). Physical fitness assessment (PF) of female students was carried out with the help of tests: running 100 m; swimming 50 m; torso tilts; standing long jump; running long jump; running 2000 m. Classes of students from the CG and the EG were held twice a week according to the schedule of the academic part of the university at the same time. At each lesson, an individual physical function was planned, which could change in accordance with the physical and functional state of the students. The stage of personality development with the use of physical activity was preceded by analyzing the possibility of forming and choosing the influences that govern them, taking into account sports specialization. The primary informational array of this was made by the

data of individual assessment of the purposefulness of the personality and FP of female students from the CG and the EG. To establish the relationship between the indicators of the mental and physical components of the structure of the personality of students, the correlation analysis of the components of the indicators of the psychological portrait was used: psychological portrait of a student from the EG and the CG; portrait of physical fitness from the EG and the CG. To study the dynamics of controlled mental qualities, the method of mathematical modeling was used.

Main results. The analysis of the results of psychological portraits of female students from the CG and the EG (table 1) showed that the basic personality traits are clearly expressed in the female students from the EG who went in for athletic and game kinds of sports, that is, in those where volitional qualities were distinguished among the psychological properties.

Table 1

The value of the mental qualities of the personality of female students (in points)

"Leading" traits of the personality	Values of "leading" personality traits			
	At the beginning of 1 year of study, before separation on KG and EG	At the end of 2 year of study		P<
		EG1-4	KG	
The power of "I"	6,02±0,68	7,00±0,76	4,35±0,76	<0,01
Fears - fearlessness	4.48±1,00	4,33±0,84	4,80±0,83	>0,05
Kindness	7,00±0,57	7,09±0,62	6,70±0,73	>0,05
Optimism	5,77±0,59	5,38±0,72	5,10±0,93	>0,05
Partnership	4,00±0,62	3,95±0,77	4,25±0,87	>0,05
Capacity for effort	2,65±0,59	5,69±0,74	3,55±0,45	<0,01
Selfishness - altruism	5,28±0,25	5,71±0,73	5,05±0,61	>0,05
Purposefulness	5,88±0,67	7,33±0,64	4,45±0,72	<0,01
Initiative	5,11±0,81	6,19±0,97	3,95±0,23	<0,01
Aggressiveness-peacefulness	6,22±0,69	5,14±1,04	5,75±0,88	>0,05
Leadership	3,45±1,03	4,93±0,42	3,75±0,62	>0,05

The profile of psychological portraits of female students from the CG had a less prominent, smoothed character, which was reflected in low manifestations of purposefulness, initiative, ability to effort, strength of "I", leadership and fearlessness. The analysis of the portraits of PF (Physical fitness) female students showed that among the female students from the EG from all sports female students who were engaged in health-improving running were in the lead. The conducted research allowed us to establish a high PF of female students who were engaged in rhythmic and athletic gymnastics, basketball, while female students from the CG showed a generally weak PF.

The analysis of the results of the relationship between the indicators of mental and physical components in the personality structure of female students from the EG indicates that intense physical loads (FL) form a pronounced correlation between the components of two personality portraits, and a person who is engaged in sports specialization to improve PF (Physical fitness) indicators, forms a new portrait that includes both physical and mental components. The previous stage of research gave us the opportunity to form a set of control factors based on the specific features of the influence of different sports on individual components of the personality structure. In the process of purposeful development of the components of the personality structure, the information array of data obtained during the analysis of the results of the study of the mental and physical components of students from the EG and CG acted as a control. The main thing in the content of the lessons from the EG was the principle of interconnection of the degree of determination of the leading personality traits with the PF indices, where the dominant manifestation of the leading quality was the basis for including the leading elements of certain sports in the plan of occupations. After the end of the classes, a repeated questionnaire survey of psychological psychological components and testing of FP indicators were carried out. Comparison of the general total assessment of mental qualities in the EG and the CG allowed us to state that it was significantly higher in the EG, 56-74 points in the EG, 38-63 points in the CG. The presence of quantitative values of the leading personality traits of female students made it possible to compose psychological portraits of female students in each group (Figure 1).

Estimation of the average value (in points) of the mental qualities of the personality of female students showed that among female students from the EG, the highest values are possessed by such qualities as: strength of "I" – 7.00 ± 0.76; kindness – 7.09 ± 0.62; purposefulness – 7.33 ± 0.64; initiative – 6.19 ± 0.97, and in the CG

the most pronounced quality is kindness (6.70 ± 0.73). The analysis of indicators of manifestation of mental qualities, activity and purposefulness testify in favor of the EG students.

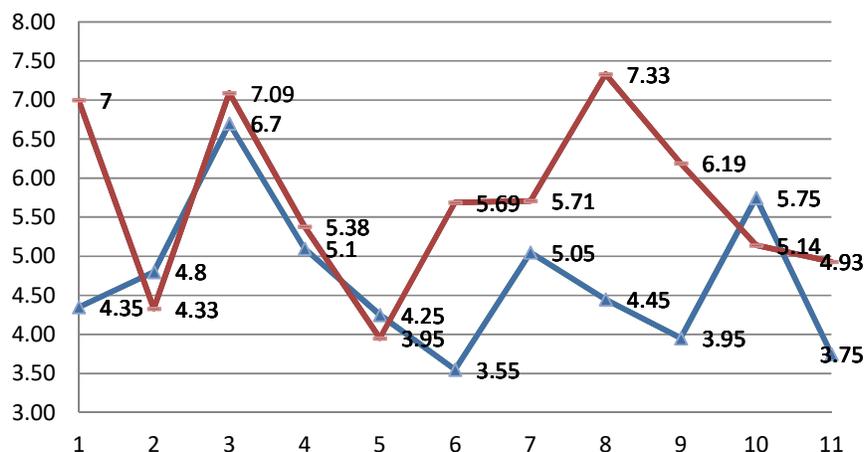


Figure 1. The value of the mental qualities of the personality of female students (in points)

Thus, the author's program PF (Physical fitness), offered by us, helped the students from the EG to reveal unrealized internal possibilities. The PF (Physical fitness) level of the female students from the EG according to all subtests improved in comparison with the initial level, approaching the estimated test requirements and even exceeded them according to some indicators. This, in our opinion, speaks of the obvious effect of the control action of physical activity. At the same time, we have determined the relationship of physical and mental qualities in the personality structure of female students from the experimental groups.

To determine the effectiveness of the formation of individual components in the personality structure, we compared the maximum values of the absolute values of the leading personality traits of female students from the EG during classes in sports specializations and in the CG during physical education after carrying out corrective influences, simultaneously comparing them with the initial data.

The analysis of the obtained results showed that among the female students of the CG the values of sociability, egoism-altruism and aggressiveness-peacefulness remained at the same level, while the indicators of fear-fearlessness, ability to effort and leadership slightly increased. It should be noted that absolute indices of female students from the CG did not approach the established maximum values of female students from the EG to none of the indicated personality qualities. At the same time, among the students from the EG, the absolute values of the strength of "I", egoism-altruism, purposefulness, initiative, leadership increased, approaching the indicators of athletes, and even surpassed the maximum values shown by the students engaged in rhythmic gymnastics (RG) and recreational running (RR - 2000 m), which is a confirmation of the management role of corrective influences. The values of the qualities remained unchanged: fear-fearlessness, kindness, optimism, sociability, according to the qualities of aggressiveness-peacefulness, the absolute values of the indicators of female students from the EG decreased.

The experience of conducting classes with female students from the EG shows a positive effect of targeted influences of physical activity (FA) classes, which are able to control the mental component of a personality. Comparison of the initial and final values of mental qualities of the portrait of female students from the EG made it possible for us to differentiate mental qualities according to the degree of controllability: controlled – strength of "I", ability to effort, purposefulness, initiative and leadership; selectively controlled – fear, optimism; uncontrollable – kindness, sociability, selfishness, aggressiveness. Thus, the longitudinal observation gave grounds to speak of the possibility of the formation of the mental component of the personality structure through purposeful physical activity.

Discussion

The study of the interdependence of the mental and physical components of the personality was carried out by the method of correlation analysis. For this, the coefficients of pair correlation (Cpc) between 11 mental qualities and 6 tests of physical fitness were calculated. The calculation of the pair correlation coefficients was carried out according to generally accepted formulas. Comparison of correlations between mental and physical components of the initial level and final data made it possible to reveal positive changes that took place with a number of structural elements of personality in EG 1-4 against the background of their connection with an increase in physical readiness indices and without positive changes in the psychological profile.

Conclusions

The analysis of the results of psychological portraits of female students from the control group and the experimental group showed that the basic personality traits are clearly expressed in the female students from the experimental group who went in for athletic and game kinds of sports, that is, in those where volitional qualities were distinguished among the psychological properties. The psychophysical status is different for female students who are engaged in sports specialization and students who are engaged in physical education, and longitudinal control is effective in the formation of the mental component of the personality structure. By guiding the level of physical status by purposefully influencing the system of physical activity, it is possible to raise the level of the mental component of the personality structure.

The analysis of the results of psychological portraits of female students from the control group and the experimental group showed that the basic personality traits are clearly expressed in the female students from the experimental group who went in for athletic and game kinds of sports, that is, in those where volitional qualities were distinguished among the psychological properties.

The physical status of an individual, which itself is a rather complex controlled system, is a control system in relation to the components of the personality structure. By guiding the level of physical status by purposefully influencing the system of physical activity, it is possible to raise the level of the mental component of the personality structure.

The proposed program, which took into account the sequential system of physical activity with the use of physical loads of sports specialization, allows the formation of a certain psychophysical structure of the personality, which includes mental and physical qualities associated with strong ($0.67 \leq Cpc \leq 1.0$) and average ($0.34 \leq Cpc \leq 0.66$) correlations. In addition, psychophysical status is different for men and women, and longitudinal control has been shown to be effective in shaping the structure of psychophysical status.

By guiding the level of physical status by purposefully influencing the system of physical activity, it is possible to raise the level of the mental component of the personality structure.

Thus, the experience of conducting classes with students of experimental groups shows the positive effect of purposeful physical activity on the ability to control the mental component of personality, and comparing the initial and final values of mental qualities of their portrait allowed to differentiate mental qualities by degree of control. personality through purposeful physical activity. According to our assumption, the physical status of the individual, which itself is a rather complex control system, is really a control system in relation to mental status. Thus, managing the level of physical status due to the purposeful impact of exercise can raise the level of mental status.

Compliance with Ethical Standards

Conflict of Interest. The authors declare that there is no conflict of interest that could be perceived as interfering with publication of the article.

Competing Interests. The authors declare that they have no competing interests.

Ethical Approval. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent. Informed consent was obtained from all individual participants included in the study. All subjects of the institutional survey gave consent for anonymized data to be used for publication purposes.

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