

PSYCHOPHYSICAL CONDITION OF VISUALLY IMPAIRED STUDENTS DURING PHYSICAL EDUCATION CLASSES

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Abstract

This paper presents the results of author's research, aimed to substantiate the dynamics of the parameters of psychophysical condition of visually impaired students during physical education classes while studying in institutions of higher learning.

Methods: The research was held on indicators of psychophysical condition such as power of neural processes, anxiety, mood, activeness, and the need for achievement.

Results: It was proved that purposeful psychophysical development of visually impaired students under the influence of effective means, methods and forms of physical education that correspond to characteristics of the nosology and operational condition, provides full inclusion in the educational process of physical education in universities.

Keywords: Visually impaired students, psychophysical condition, self-esteem, strength of neural processes, means of physical education

Actualization. Special literature data analysis (Demyrchoglyan G.G.1999; Tolmachev R.A. 2004; Khrul O.S. 2011) allows us to divide visual impairments into deep and non-deep visual impairments. Deep visual impairments are associated with significant reduction of such core functions as visual acuity and visual range that have distinct organic visual deprivation.

Non-deep visual impairments are associated with dysfunction of oculomotor functions (strabismus, nystagmus); impaired color vision (color blindness, dichromasia); impaired vision character (impaired binocular vision), and vision acuity impairment that is associated with a disorder of optical mechanisms (myopia, hyperopia, astigmatism).

It is common that young people with non-deep visual impairments are admitted to higher education institutions. Thus, the most common visual

impairments among them are nearsightedness (myopia), farsightedness, strabismus, nystagmus, astigmatism, amblyopia, cataract, and glaucoma.

Analysis of special literature data (Litvak A.G., 1998; Sermeyev B.V., 2001; Tolmachev R.A. 2004) shows that organic disorders of visual analyzer deteriorate social relations, change social status of visually impaired person, and facilitates the development of specific demeanors that affects psychological development.

Asthenic condition is inherent for youth with visual impairments and is characterized by a significant decrease in their desire to communicate, nervous tension, and increased fatigue. It should be borne in mind that young people with visual impairment are in stress more often than their healthy peers. Constantly, high emotional tension, and feeling of discomfort may in some cases be the cause of emotional disorders, imbalance of excitation and inhibition processes in cerebral cortex. A.G. Lytvak (1998) noted that among youth with visual impairments, one can meet people with a strong-will character, though at the same time, they may have such defects on their will such as impulsive behavior, stubbornness and negativism.

The author emphasizes that under proper organization of education and training, the formation of necessary qualities of personality, motivation and settings occurs. A person becomes practically independent of the condition of their visual analyzer. He also argues that the level of attention of visually impaired students is subject to the same laws compared to students without visual disability, and can reach the same level of development.

Training of attention and forming of attentiveness is performed on the same basis and with the same means as in mass educational institutions.

However, the processes of the memory (storage and forgetting) depend on the quality of learning the material, its significance to the individual, number of repetitions, and the typological characteristics of personality.

Making and remembering accurate and simple movements for visually impaired people requires 8-10 repetitions, whereas for non-visually impaired people, it takes 4-6 repetitions. Therefore, in order to learn a motor action, visually impaired people require more repetitions, because without this reinforcement, a tendency of the motor action decay is observed.

Youth with visual impairments master skills of tactile-visual and visual identification during specialized training. Sometimes, skills of nonspecific recognition by insignificant signs (e.g. sound that is typical for the subject, smell, etc) are used. Thus, a high level of auditory and tactile memory is observed (Sermeyev B.V., 2001; Tolmachev R.A. 2004).

Youth with visual deprivation has a dominant audio-motor-visual perception. It should be noted that the impairment of the visual sensor leads to the formation of new inter-sensory connections and change in dominance

of other sensory systems. However, no matter which sensory system dominates in perception of the environment by a person with visual impairment, it reflects the interaction between different sensors, and their mutual influence on the process of recognition, being the knowledge of the world in the form of feelings and thoughts (Sermeyev B.V., 2001).

The researchers argue that visual impairment hinders spatial orientation, delays the formation of motor skills and leads to a decrease in motor and cognitive activity. A significant lag in physical development is observed due to complications in visual imitation and mastery of spatial and motor actions. Hence, correct posture while walking, running, playing active games, coordination and precision of motions gets impaired (Demyrchoglyan G.G.,1999; Litvak A.G., 1998; Malaev D.M. 2001;SermeyevB.V., 2001; Tolmachev R.A. 2004; Yarymbash K., 2004; Khrul O.S. 2011).

A thorough research on physical training and physical therapy was conducted by B.V. Sermeyev (2001). It revealed general and specific patterns of identity formation of blind and visually impaired individuals. They allowed specifying in theory and practicing the task of the educational process, identify the most effective forms and methods of corrective work that aims to develop the compensatory function of the human body and overcome different deficiencies which occur as an effect of loss of vision or its impairment.

Scientific studies (Demyrchoglyan G.G.,1999; Malaev D.M. 2001; Tolmachev R.A. 2004) provides data on anatomical and physiological connection between visual sensory system and vegetative functions, relationship between visual afferentation and metabolism, condition of cardiovascular and respiratory systems. The authors suggested that the energy of a light beam that is directed through the eye to hypothalamus and hypophysis regulates the vegetative and endocrine functions of the body and affects the central nervous system.

Therefore, implementation of reserve capacities of visually impaired person's body can be effective only under rational physically active regime. Also, the formation of motor activity is only possible using differentiated approach, taking into account the characteristics of impairment.

Depending on when the loss of sight occurred, one can observe orientation in space, visual and muscle memory when performing motor actions that were familiar to the individual prior acquiring the disability, which can facilitate the process of learning. Thus, the importance of feedback accompanying the execution of motor actions should be remembered, as the student does not always imagine their own execution of a task.

The characteristics of a differentiated approach in controlling the formation of motor skills is the identification of specific errors in groups; and

the possibility of their correction is not just verbally, but also uses tactile sensations when reproducing the elements of the action that have errors. Therefore, specific feature of leading the education process during motor skill acquisition phase is to choose a teaching method based on the pathology of the visual sensor, level of physical health and fitness and the type of a higher nervous activity, i.e. individual characteristics of students. Therefore, the speed of formation of motor skills among blind and visually impaired students is longer than among students without visual disability.

We emphasize that visually impaired students require: correction of the actual motions, as their motions are constrained and not coordinated; correction of vision; correction of their figure, posture and flat feet; correction of the development of their physical qualities; correction of differentiation of time, efforts, space, precision of movements, etc. Thus, pedagogical control suggests compulsory presence of feedback not only during the practice of motor actions, but also through verbal adoption of the technique using questioning. Control over formation of motor skills during initial and ongoing execution is conducted through a survey based on memorization of theoretical information and their own feelings.

The goal of our study - is to substantiate the influence of the author's technology of teaching motor actions and increasing motor activity on psychophysical condition of visually impaired students in institutions of higher education.

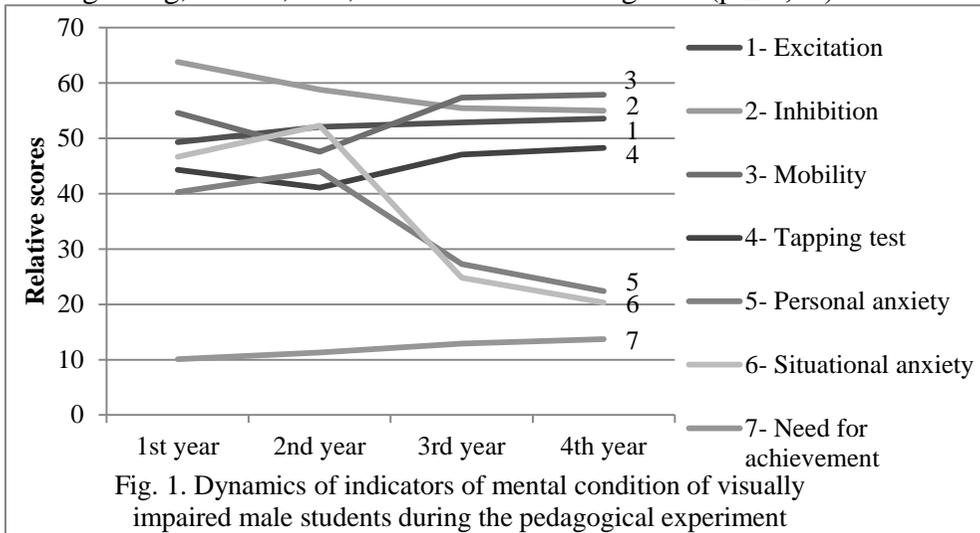
The main material of the research: During pedagogical experiment, the parameters of psychophysical condition of visually impaired students were characterized by positive changes under the influence of purposeful physical activity and sports.

The strength of neural processes as per indicators of excitation, inhibition and equilibrium among visually impaired students is characterized by slow positive changes over the years of the study at the level of $p \leq 0,05$. Hence, mobility change was observed among men and women with visual impairment at the level of $p \leq 0,01$.

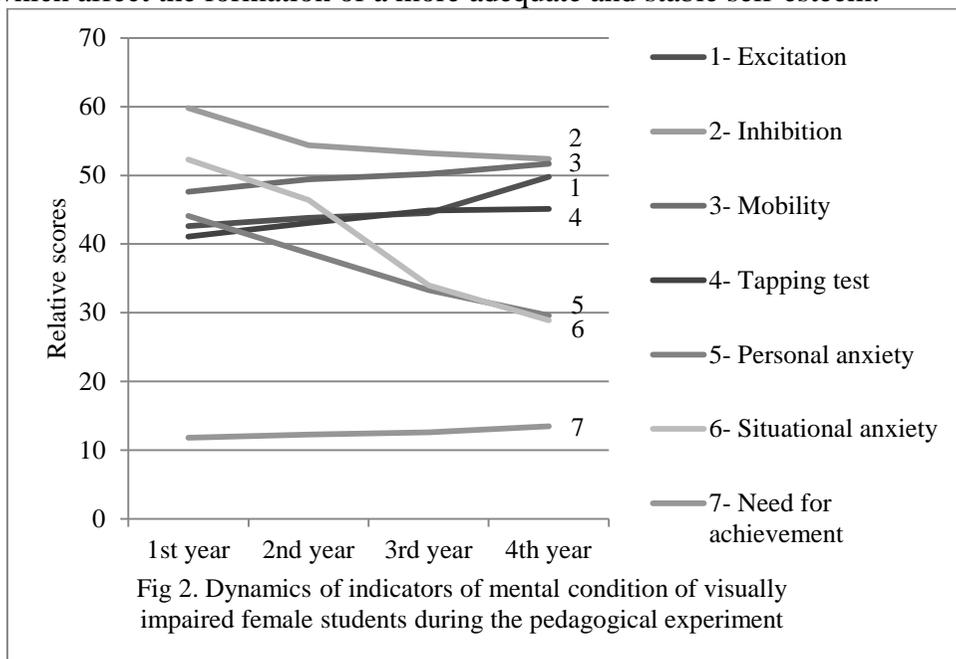
After the experiment among visually impaired students, the strength of their neural processes of excitation, inhibition, mobility and equilibrium approached the average level. The strength of neural processes that is measured using tapping test among men and women is weak, although differences occurred at the level of $p \leq 0,01$ among girls and $p \leq 0,05$ among boys compared with the original data (Fig. 1-4).

According to the results of the research, indicator of personal anxiety has positive changes at the level of $p \leq 0,05$ during all years of the experiment. If at the beginning of the experiment, visually impaired students had moderate level of anxiety ($40,3 \pm 2,81$ among men, $44,1 \pm 2,31$ among women), then at the end - low level of anxiety: $22,4 \pm 4,09$ - men, $29,6$

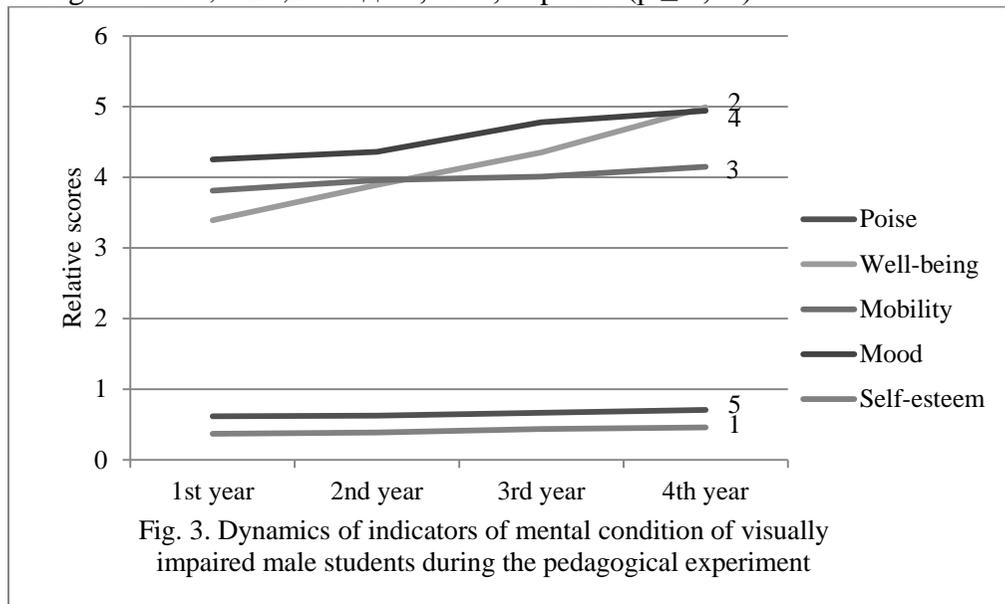
$\pm 3,96$ – women. Furthermore, similar results were obtained as per indicator of situational anxiety among men as well as among women: $52,3 \pm 1,51$ at the beginning, $28,9 \pm 3,71$ – at the end among women ($p \leq 0,05$); $46,7 \pm 1,76$, at the beginning, and $20,3 \pm 2,78$ – at the end among men ($p \leq 0,05$).



The data obtained allows us to interpret this dynamics as reduction of levels of conscious and unconscious anxiety, and increased stress tolerance, which affect the formation of a more adequate and stable self-esteem.



As a result of integrated use of the tools of physical education and sport activities, the perception of their own health, mobility and mood (measured through self-assessment using SAN scale) for visually impaired students became more objective at the end of the pedagogical experiment in comparison with the original data. Among visually impaired men and women, the average score of wellbeing (health-wise) has normalized: for men, it changed from $3,39 \pm 0,22$ to $4,99 \pm 0,31$ points, and for women, it changed from $3,86 \pm 0,28$ to $5,01 \pm 0,35$ points ($p \leq 0,05$).



A similar dynamics is observed with the activity index: if it was observed at the beginning of the experiment among visually impaired students (men and women) for an underestimation of self-esteem for 1,19 and 1,35 points accordingly, then at the end of the study, its level has come much closer to norm. Self-esteem among men has increased from $3,81 \pm 0,31$ to $4,15 \pm 0,55$ points ($p \leq 0,05$), and among women – from $3,65 \pm 0,21$ to $4,21 \pm 0,69$ points ($p \leq 0,01$). As for the mood, after the experiment was observed, a positive dynamics: self-rating of their mood among men changed from $4,25 \pm 0,11$ to $4,94 \pm 0,38$ points ($p \leq 0,05$), which approximately corresponds to the norm; hence, self-rating of their own mood among women changed from $4,39 \pm 0,19$ to $5,01 \pm 0,45$ points ($p \leq 0,05$).

However, significant changes took place within the indicator of the need for achievement. At the beginning of the experiment, a low level of need for achievement was set among men and women: $10,1 \pm 0,5$ and $11,8 \pm 0,3$ points ($p \geq 0,05$) accordingly.

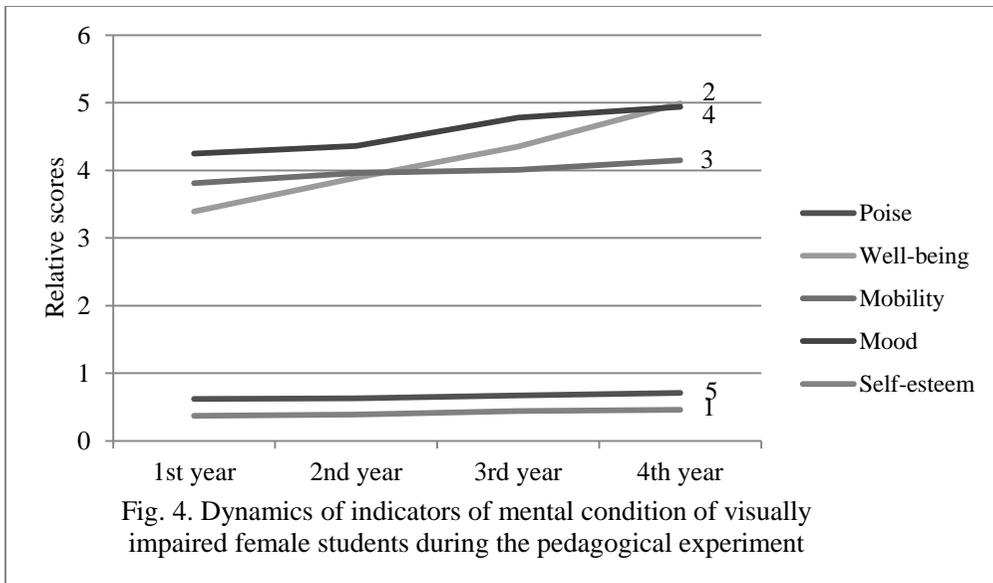


Fig. 4. Dynamics of indicators of mental condition of visually impaired female students during the pedagogical experiment

At the end of the experiment, following author’s program, the level of the need for achievement has already reached the average: among women - $13,5 \pm 0,9$ points ($p \leq 0,05$); and among men – $13,7 \pm 0,8$ points ($p \leq 0,05$).

Therefore, the self-esteem of the individual (as per methodic of S.A. Budassi) helps in analyzing the level of maturity of a person. During the experiment, a dynamics in the levels of self-esteem of the individual was observed. Among men, it changed from $0,37 \pm 0,03$ to $0,46 \pm 0,07$ ($p \leq 0,05$), among women – from $0,40 \pm 0,05$ to $0,44 \pm 0,05$ ($p \leq 0,05$), i.e. self-esteem became more adequate.

Conclusion

The results of the multi-year pedagogical experiment showed that any nosology is characterized by a set of mental disorders. Changes that occur affect different levels of the psyche of visually impaired students ranging from cognitive processes up to personality changes.

The analysis of psychological and educational assessment of the strength of neural system as per indicators of excitation, inhibition, mobility and equilibrium indicates a presence of a weak neural system, low expression and operability of the central nervous system.

Output data based on indicators of personal and situational anxiety of visually impaired students point that they are the most vulnerable to adverse conditions and psychological discomfort in an integrated student environment.

Level of self-perception of health, mobility and mood of visually impaired students indicates a low self-esteem as per these indicators, and the level of the need for achievement is also detected as low or moderate.

However, it has been proven that purposeful psychophysical development of students with visual impairments, under the influence of effective tools, methods and forms of physical education that correspond to the characteristics of nosology and operational condition, facilitates their full inclusion in the process of physical and sports education in higher education institutions.

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