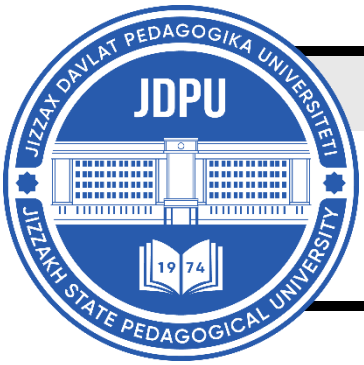
DOI: https://doi.org/10.37547/mesmj-V6-I3-15 Pages: 134-142

MENTAL ENLIGHTENMENT SCIENTIFIC – METHODOLOGICAL JOURNAL



MENTAL ENLIGHTENMENT SCIENTIFIC – METHODOLOGICAL JOURNAL

http://mentaljournal-jspu.uz/index.php/mesmj/index

METHOD OF REHABILITATION AND INTEGRAL ASSESSMENT OF STUDENTS WITH PHYSICAL DISABILITIES

R. A. Ernazarova
Independent researcher
Uzbekistan State Physical Education and Sports University Nukus branch
Uzbekistan, Karakalpakstan

ABOUT ARTICLE

Key words: Students with musculoskeletal injuries , adaptive physical education and parasports specialization.

Received: 16.05.25
Accepted: 18.05.25
Published: 20.05.25

Abstract: This article discusses the methodology of rehabilitation and integrated assessment of students with physical disabilities. Physical training, psychological approaches, and individual programs used in the rehabilitation process are analyzed. Through integrated assessment, students' health, mobility, and social adaptation are assessed. The article highlights the importance of effective rehabilitation and assessment methods in an inclusive educational environment. As a result, scientific and practical recommendations for the successful integration of students into society are developed.

Introduction. In our republic bribe sports types development for wide opportunity and conditions create, them physical opportunity limited and disability was individuals sports to the types redirect and selectively Today, in our country, there are many conditions for obtaining and preparing is being created. "In sports" high to the results achieve for the purpose many opportunities created is coming, including today's on the day opportunity Students with disabilities are introduced to adaptive sports by studying their nosologies. to teach, training theory and public sports types methodology is effective in students through para sports to

actions to teach process "development" tasks such as has been determined. Today on the day locomotion apparatus damaged and aimed at teaching disabled students para sports The measures are also taking different forms. Based on this necessity, Developing a methodology to improve the balance ability of students with disabilities to create a methodology for organizing exit and training processes, and development is of paramount importance.

The purpose of the study is to develop proposals and recommendations for improving the set of exercises to develop the ability to maintain balance in students with physical disabilities.

Research objectives. 1. Analysis and generalization of scientific and methodological data on the topic. 2. Development of a set of exercises to develop the ability to maintain balance in students with physical disabilities. 3. Scientific substantiation of the effectiveness of the developed set of exercises in pedagogical experience.

Research results and their discussion. Maintaining balance in students with physical disabilities ability is of great importance in the physical training of any para-athletes. Especially for students of adaptive physical education and sports, the development of the ability to maintain balance is important not only for improving sports results, but also for improving the level of health in everyday life, as well as for improving motor activity. This set of exercises developed by us includes static, dynamic, coordination and strength exercises and is adapted to the nosological groups of students with physical disabilities.

Table 1

A set of exercises to develop the ability to maintain balance

Exercise type	Exercise name	Execution method	Number of repetitions / w akt
Static balance exercises	Standing on one leg	Standing on one leg, extending arms to the side or forward	20-30 seconds (every month in white)
	Maintaining balance while leaning against a wall	Standing with one leg raised, leaning against the wall	20-30 seconds
	Keeping your eyes closed	Maintaining balance with eyes closed	15-20 seconds

Dynamic balance exercises	Walking along the line	Walking along a line with your feet back and forth	10-15 steps
	Changing the center of gravity with your hands	Twisting the body with arms out to the sides	10-12 times
	Step by step walk	Walking slowly forward or backward	10-12 steps
Develop coordination skills	Exercises with a ball	Throwing and catching the ball forward, backward, or sideways	10-15 times
	Moving arms and legs alternately	Turning the body left and right	10-12 times
	Various movements to music	Moving hands or feet in time with the rhythm of music	30-40 seconds
Flexibility and strength exercises	Plank exercise	Standing in a plank position on your knees or elbows	20-30 seconds
	Sit-up exercises	Sit-up with arms extended forward	10-15 times

A special set of exercises developed by us to develop the balance ability of students with disabilities was used in the training process. The above set of exercises was developed in accordance with the individual condition of the students. This set of exercises helped students with disabilities develop the following movement components. In this case, when developing static balance, the student-athlete learns to maintain balance in one place, which increases his ability to stand in a stable position. In addition, it is also important to improve the dynamic balance of students with disabilities. By using these tools, it is possible to maintain balance during movement and strengthen the ability to move in different directions. By regularly using tools that develop coordination skills, students' body movements become harmonious and their reaction and agility skills improve. Developing flexibility and strength is also important in increasing the motor activity of students with disabilities. By using these tools, students' endurance and muscle strength increase. This helps to improve the overall physical fitness of students with disabilities.

These exercises help student-athletes develop their motor skills and increase their ability to move independently in daily life. When performed regularly, an athlete's ability to maintain balance improves significantly.

The mechanism of using the ForcePlatformSmart platform to determine the balance of physically disabled people. Maintaining and developing balance is very important for students specializing in adaptive physical education and sports. According to their nosological groups, developing the ability to maintain balance is an important task for students with damage to the musculoskeletal system and disorders of the sensory system. Taking this into account, there is currently a need to monitor the ability to maintain balance of people with physical disabilities using modern equipment and assess their movements based on the degree of deviation. Taking the above into account, we have achieved the opportunity to assess the ability to maintain balance of students with physical disabilities using the ForcePlatformSmart platform and develop it through various balance exercises, such as adaptive and co-reflex. This mechanism is an important tool for using the platform for sports analysis, students' movements around the X and Y axes, degrees of deviation, range of motion, training and rehabilitation. The benefits of using this platform for student-athletes include: assessing balance ability, determining an athlete's static and dynamic balance, improving running and movement efficiency, measuring stride length, weight distribution, and reaction time, providing scientifically-based data. It is also a customized program for monitoring training, tracking athlete development through specific exercises, recovering from injuries and rehabilitation, and for student-athletes with orthopedic or central nervous system disorders and various disabilities.

While balance is essential for any sport, for student athletes, this ability is considered one of the leading physical qualities. Because their physical capabilities and coordination of movements are different from those of ordinary athletes. In addition, the Force Platform Smart platform is an innovative technology designed to assess and develop the balance, reaction time and accuracy of movements of student athletes.

This platform helps improve student-athletes' key performance indicators, such as static and dynamic balance, gait coordination, and reaction speed. At the same time, this technology also helps accelerate the rehabilitation process.

The table below provides information on balance exercises for student-athletes, their evaluation criteria, and analysis by recording the results.

Table 2

Integration and evaluation criteria for balance development tools

Exercise type	How to use the platform	Efficiency	Evaluation criteria	Satisfactory	Medium	Excellent
Static balance exercises	Performing various movements while standing on the platform (standing on one leg, twisting the body)	Increasing stability	- UOM (center of gravity) shift - Body hold in vertical position (°)	UOM displacement > 5 cm, body flexion > 15°	UOM displacement 3-5 cm, body tilt 10-15°	UOM displacement < 3 cm, body tilt < 10°
Dynamic balance exercises	Moving while standing on the platform (stepping forward, walking sideways)	Coordination of movement	Maintaining balance during movement - Hand-foot coordination (°)	Balance deviation more than 45°	Balance between 20-45°	Balance < 20° deviation
Stepping and reaction exercises	Estimating step frequency and weight distribution using a platform	Improving sports results	- Step length and frequency - Reaction time (ms)	Step length < 50 cm, reaction time > 500 ms	Step length 50-70 cm, reaction time 300-500 ms	Step length > 70 cm, reaction time < 300 ms
Rehabilitation exercises	Checking leg and arm balance using a platform	Injury prevention	- Recovery dynamics (s) - Body tilt angle (°)	Balance < 10 seconds, body tilt > 20°	Balance hold 10-20 seconds, body tilt 10-20°	Balance hold > 20 seconds, body tilt < 10°

Based on the above table, a standard of assessment criteria for the ability of students with physical disabilities to maintain balance by performing static, dynamic, stepping and reaction, and rehabilitation exercises, such as satisfactory, average, and excellent, was developed depending on the degree of shift in the total center of gravity of the participants. Using this platform, the opportunities for students with physical disabilities to increase movement stability, perform movements in harmony, prevent injuries, and improve sports

results increased. Based on the degree of movement deviation, methods of using the platform such as standing on one leg on the platform to hold the body in a vertical position, turning the body, etc. were used during our study. By integrating balance exercises during training, the ability to determine and assess the coordination ability of students with physical disabilities was expanded.

The practical significance of using the platform is as follows. In static balance exercises, the vertical grip angle and the shift of the UOM (center of gravity) of student-athletes play an important role. If the body tilt is more than 15°, this indicates poor balance. A tilt of 10-15° is considered an average result. If it is less than 10°, this corresponds to an “Excellent” grade and the athlete can maintain stable balance.

In dynamic balance exercises, the angle of balance during movement is measured in degrees. If an athlete's movement deviates by 45° or more, this indicates a violation of balance. A deviation between 20-45° indicates an average level of balance development. A deviation of less than 20° is an ideal result and indicates that the athlete's balance is high.

In the stepping and reaction exercises, step length and reaction time are evaluated in a specific time unit. If the reaction time is higher than 500 ms, the student-athlete's reaction ability is assessed as poorly developed. A result in the range of 300-500 ms indicates an average level. If it is less than 300 ms, this indicates that the student-athlete can respond quickly and effectively.

In rehabilitation exercises, the time of holding the balance and the angle of the body's inclination are important criteria. If the time of holding the balance is less than 10 seconds and the body's inclination is more than 20°, this is considered a weak result. Holding for 10-20 seconds and bending for 10-20° is an average result, indicating that the athlete is still learning to move stably. Holding for more than 20 seconds and bending for less than 10° is an ideal result, indicating that the athlete has stable balance.

Using the ForcePlatformSmart platform serves as one of the important instrumental methods for improving student-athletes' balance ability, developing movement coordination, and effectively managing the rehabilitation process .

The developed assessment criteria allow for accurate measurement and analysis of the student-athlete's development dynamics . It makes it easier for professionals, coaches, and doctors to create and improve individual plans. The process of adaptive physical education and

sports training becomes more effective through digital monitoring . This mechanism helps student-athletes achieve high results in competitions .

In conclusion, the use of the ForcePlatformSmart platform serves as an effective solution for assessing and improving the ability to maintain balance for student-athletes. The fact that this criterion is implemented in precise units such as angle degrees (°), time (ms), distance (cm) and force (kg) allows for an accurate measurement of the dynamics of the physical development of student-athletes. Coaches and rehabilitation specialists can evaluate the results of student-athletes and prepare individualized training plans for them. This methodology helps student-athletes achieve higher results through physical training.

The table shows four main groups of balance exercises:

static balance exercises - teach students to maintain stability while standing in a certain position. Dynamic balance exercises - allow students to maintain balance while moving. Stepping and reaction exercises - assess students' reaction time and coordination of stepping. Rehabilitation exercises - are designed to monitor and improve the recovery process after injury.

The criteria for assessing the balance ability of students with physical disabilities help determine whether the performance of each exercise corresponds to the "Satisfactory", "Average" and "Excellent" levels of results based on the degree of deviation of movements.

Table 3

Dynamic assessment and analysis of balance ability

Indicator	Evaluation method	Satisfactory	Medium	Excellent
Balance development	UOM displacement reduction (cm)	Improvement < 1 cm	Improvement 1-2 cm	Improvement > 2 cm
Effectiveness of actions	Body tilt angle (°)	> 15°	10-15°	< 10°
Reaction rate	Response time reduction (ms)	Improvement < 50 ms	Improvement 50-100ms	Improvement > 100ms
Muscle symmetry	Difference in load on legs (kg)	Difference > 30 kg	The difference is 15-30 kg.	Difference < 15 kg

Criteria for assessing the dynamic movements of students with physical disabilities have been developed, according to which the following assessment criteria have been developed: the level of development of balance in maintaining balance - in terms of the total center of gravity shift in cm, the efficiency of movement - in degrees of body tilt angle, the reaction speed - in terms of the reduction of response time, and the indicators of muscle symmetry - in terms of the difference in load on the legs in kg., satisfactory, average, excellent.

Conclusion. An adapted and individual approach is considered the most optimal method for determining and assessing the balance ability of students with physical disabilities. The platform is adapted for different categories of student-athletes based on nosological groups. In this case, parameters are set in accordance with the individual needs of athletes running with a lower leg prosthesis, athletes using a wheelchair, athletes with central nervous system disorders and various disabilities.

At the same time, this platform is important for the rehabilitation of functional activities of students with physical disabilities and the prevention of injuries. In addition, it allows you to monitor changes in the balance, movement and reaction of student-athletes during the recovery process after an injury. In addition to adaptive physical education and sports coaches, physiotherapists can use the platform to develop individual treatment plans.

This platform is one of the most important tools for improving sports performance. In this regard, the program serves as a practical tool for increasing stride length, balance and reaction speed for running, rowing, cycling and other parasports. The platform's real-time results function allows coaches to evaluate the effectiveness of training.

References:

1. Dmitriev B. C. Vvedite v adaptivnuho fizicheskuyu reabshshtastssho: Monograph. - M.: Izd-vo VNIIFK, 2001.-240 p.
2. Dmitriev B. C. Pedagogical problems of self-reliance // Sb. thesis nauch. dokladov Mejdunar. nauch.-practitioner. conference "Narodnoe obrazovanie v XXI veke". - M.: Izd-vo MPU "Narodnyi uchitel", 2001. - S. 88
3. Mirjamalov M.Kh. The possibility of kinematic movement after spinal cord injury // International Scientific and Practical Conference on the Prospects for the Development of the Sport of Wrestling 2022. - P. 538-539 .

4. Mirjamalov M.Kh. The effectiveness of the methodology of pedagogical control of training in para-sports // Eurasian Journal of Sport Science 2022; 2(1): - P. 156-159 [13.00.00 Order No. 01-10/1103]
5. Khodjamkeldiev, G. The importance of recovery in the processes of sports training // Actual problems of social and humanities sciences/Aktualnye problemy sotsialno-humanitarnyx nauk/Actual Problems of Humanities and Social Sciences. , 3 (7), (2023). 233-237.
6. Khojamkeldiyev, GS Medical and biological means of increasing working capacity and recovery of athletes // Mental Enlightenment Scientific-Methodological Journal , Jizzakh, 2023. - P.232-237.
7. Khujamkeldiyev, GS (2023). The importance of recovery in the processes of sports exercises. statey XIX Mejdunar. Nauch. conference, Belgorod, April 25-26. 2023 / Belgor. Mr. technology un-t.–Belgorod: Izd-vo BGTU, 2023.–471p. ISBN 978-5-361-01170-4 (P. 462).
8. Khodjamkeldiev, G. (2023). The importance of recovery in the processes of sports training // Actual problems of social and humanities sciences/Aktualnye problemy sotsialno-humanitarnyx nauk/Actual Problems of Humanities and Social Sciences. , 3 (7), - C.233-237