

MEASURES FOR INJURY PREVENTION IN PHYSICAL AND HEALTH EDUCATION CLASSES

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Abstract: Exercise can have different effects on the human body and on the human organism. Influence such as physical activity can sometimes cause more or less pathological changes in the organism. The changes can adversely affect the humoral status due to e.g. excessive fatigue, or the harmful impact may occur in the form of mechanical injury – caused by excessive stress and the action of internal muscular force or otherwise external mechanical force. Sports professor who implement the contents of sport and physical education, as well as coaches and doctors, should be aware of these dangers in order to prevent possible injuries. A large number of authors believe that injuries caused during sports and physical education can be called sport injuries, and in order to reduce them and for the purpose of the most successful implementation of the teaching process, it is necessary to pay attention to injury prevention measures. The teaching staff on this issue must be warned and trained, that is to have appropriate knowledge. "Appropriate knowledge" in this case is not only related to the medical health segment, but also to professional scientific knowledge in the field of sports and physical education, then knowledge in the field of classroom work, with special emphasis on the existence of appropriate desire and motivation of teachers to work with students. By adhering to and undertaking empirically elaborated rules and procedures with students, devices, aids, and appropriate orientation in time and space, the exercise process will be ensured in such a way that injuries to students in the teaching process of physical education are minimized.

Keywords: Physical and Health Education teaching, Kinesiological education, Injury prevention

INTRODUCTION

Physical efforts during physical education classes should be planned and programmed to achieve positive effects on the anthropological status of the student population (Hadžikadunić and Mađarević, 2004). However, physical activity, due to the complexity and realization of movements in different situations, can sometimes cause negative changes (Najšteter, 1991). It is possible that in certain cases, with extremely high physical effort, negative side effects occur (muscle pain, sleep disorders, hormonal imbalance and other). Sports professors, coaches, doctors and others working in physical education and health education should be aware of these dangers in order to possibly prevent them (Rašidagić and Mekić, 2011). In addition to such negative side effects, there is another danger in the teaching process of physical and health education, which is reflected in purely physical injury (Gjurić, 1989). During the movement in class, carelessness of students, improper organization of work, poor arrangement of teaching aids, poor assessment of the time component as well as other factors can cause mechanical - physical injury. Sports injuries, i.e. damage caused in sports halls, are mainly caused by mechanical force (Pavlović et al., 2015). Sport injuries are caused by the impact of an object, an opponent's player, a fall or even after an excessive contraction of one's own muscles (Medved, 1987). Injuries that occur during physical education and health education or sports or physical education classes are caused by some of the above causes, so we can call them sports injuries (Milanović, 1993). In order to be able to adequately protect themselves in the teaching process, the teaching staff, but also children and youth who

implement the teaching content, should be familiar with prevention measures, which are still the most effective protection measures. If they already occur, injuries would need to be adequately treated (first aid) immediately after they occur, as this prevents an increase in damage to the locomotor system. In this case, the teaching staff should - must be fully trained to provide first aid, which is not present in practice, so that prevention measures are still the most effective means of implementation.

DISCUSSION

In order for the teaching process to be as successful as possible, care should also be taken to prevent student's injuries. Sometimes, regardless of the preventive action, injuries can occur during the teaching process. If all necessary measures are taken before, during and after the completion of the process of working with students (Najšteter, 1997), such cases will be significantly less, and even if injuries occur, injuries will be significantly less severe. Then it is possible that their consequences disappear during the class or the teaching day (smaller and lighter blow, more clumsy landing, less stretching). If the teacher / professor takes appropriate measures, he/she will be able - in case of injury, to justifiably appear before the parents, the school management, as well as other relevant bodies that can analyze the cause of the injury. The prevention measures that we can take, which are aimed at increasing occupational safety (Rašidagić et al., 2016), the safety of students and the

preservation and improvement of their health can be divided according to the following:

Health and hygiene prevention measures,

Preventive measures regarding the control of the correctness of devices and teaching aids,

Preventive measures to protect students, help students and assist students,

Order and discipline in class as a measure of preventive activity,

Motivation and stimulation at work as a measure of preventive activities,

Prevention by applying the sign for increased attention and

Injury prevention or self-preservation of teachers/professors when working with students

Practical application of prevention measures

Health and hygiene prevention measures

The implementation of health measures implies that the teacher, in order to start the process of realization of the program contents at all, must receive appropriate information about the health of students. At the beginning of the school year, the teacher, with the help of a survey conducted among students and parents, gets basic information about whether students are healthy (Čokorilo and Mikalčki, 2014). Parents need to be interviewed because children can sometimes consciously, and sometimes out of ignorance, conceal their own health condition (parents of students can deny this information due to possessive or non-specific behavior towards the child). The teacher can also be provided with an appropriate medical document on the basis of which it is clear what the health status of the student is. All information the teacher/professor receives about the health of his/hers students, accepts with caution and if he/she can check them from different sources (if the knowledge of the student checks it with parents, if the knowledge is from parents, checks it with the school doctor, etc.) "Student personal development card". In the process of collecting information about the health of students, the teacher must take into account the secrecy of the obtained data as well as keep all possible information "for himself". Based on the determined health condition, the teacher can assume for the realization of which teaching contents the children are capable of. It is clear that regardless of the possible presence of a disease, it will not be used to completely free the student from the realization of the content of physical education and health education (this attitude is supported by modern processes of inclusion in teaching where it is considered that there is no student who cannot participate in physical education and

sports). Furthermore, the teacher adapts the teaching contents from the school curriculum for the generation to which the student belongs, to the remaining abilities of the students. The teacher, even during the realization of activities during classes, controls the ability of students to realize the planned tasks and brings adequate solutions in order to change them. Student health is a variable category, so a student who was completely healthy at the beginning of the school year may become ill or, in the case of a chronic illness, the same may worsen.

Preventive measures regarding the control of correctness devices and teaching aids

Preventive measures regarding the control of the correctness of devices and teaching aids include all activities of teachers that will be aimed at the safety of students in school and extracurricular activities. Preventive measures include the following activities:

Checking the available spaces within which the teaching contents will be realized, depends on whether it is a closed or open space. The closed space is usually a hall for physical and health education in which teaching contents are realized every day. The temperature, lighting, dust and ventilation are checked in the hall. At the beginning of each school day, it is necessary to check that there is no damage to the surface for teaching activities (damage to the parquet, dents in the rubber surfaces, etc.). The walls of the hall are also subject to inspection since it is possible to determine e.g. radiators move or introduce new ones while the teacher was not present. Such places should be provided by the teacher with additional protection or at least by introducing students to the new situation. In the case of open spaces provided for the implementation of teaching content (school sports fields), the teacher can check them in the above manner. In jumping pits, it is mandatory to inspect the sand level and its structure. If there are unarranged spaces for the realization of teaching contents (excursion), it is obligatory to perform additional checks. It should be checked whether there are foreign bodies on the specified area, different hazards, different biological, mechanical or chemical waste, and above all the adequacy of the position of the specified area should be determined, which should not be near highways, water surfaces, watercourses or steep surfaces. Special preventive measures are required by the realization of teaching contents on snow, water, on the mountain, on camping, wintering, excursions.

Checking the devices necessary for the realization of program contents is obligatory in terms of controlling the strength of hanging, jumping devices and devices for climbing, resistance and/or gymnastic exercise. Then the function of the springboard, the stability of the Swedish benches and beams, as well as the correctness of the Swedish ladder should be checked.

The correctness of teaching aids (balls, cones, hoops, etc.) is also subject to control. Mats and sponges that are used as a base on which landings are made or which provide jobs should be inspected for structure and elasticity. The teacher checks all aids before each addition to use. If there is a doubt in the correctness of any of the teaching aids, it is removed and not put into function.

After the end of the school day, it is necessary to return all teaching aids and devices to their original positions. On that occasion, the teacher can determine whether certain damages have occurred and prepare for their elimination.

Preventive measures to protect students, help students and assist students

Before proceeding to consider the basic theoretical assumptions relating to storage, it is necessary to clarify the basis for the definitions of this term. In practice, different terms such as the term guarding and the term assisting, which are usually applied as if they have the same meaning. All previous experiences (Najšteter 1997) from practice show that these are essentially three different concepts with completely different actions of teachers with students. The concept of preservation implies a series of complex procedures, part of which is applied in preparation for the teaching process and part is realized directly during the class.

Precautionary Measures

Analyzing the "notion of precaution", it can be stated that today in theory a complex of measures would be determined that includes this notion according to the following:

Taking precaution of students with appropriate methodical work with students,

Taking precaution of students by educational work with students,

Taking precaution of by applying organizational measures in classes,

Taking precaution by regular control of students' motor abilities,

Keeping good knowledge of students by teachers,

Direct care for student and

Self-awareness of students.

Taking precaution of students with appropriate methodical work with students

The teacher/professor as a good expert in the development of the curriculum should meet the parameters required in the diagnostic, analytical,

prognostic and valorization verification phase of programming (Findak and Neljak, 2006; Neljak, 2013). If the development of the curriculum is carried out through these four phases, the teaching units will be placed in appropriate methodological sequences between techniques of different elements and methodological sequences within one technical element (Bergoč and Zagorc, 2000). In practice, this will mean that the techniques of the elements are learned by applying the principles of gradualness and systematicity, in other words the approach of educating techniques on complexity from simpler to more complex, from easier to more difficult, from known to unknown and from closer to further. This approach prevents injuring students. Also, within the technique of one element, the various movements belonging to that technique (if the complexity of the technique requires it) should be decomposed into learning less complex and less demanding to more complex and demanding (of course if this technique requires an analytical approach at all). The student will then gradually upgrade the simple or less dangerous movements and thus the injury of the student will be prevented.

Taking precaution of students by educational work with students

During the class, but also during the realization of other forms of work in the system of physical and health education, the teacher/professor must continuously and directly influence the education of students (Findak, 2001). Regarding the undertaking of activities within this area, it is important to apply the following preventive measures:

Students are asked to adjust their behavior towards teaching aids, which should be with due care, so that they would not be damaged, since they were used by generations before, but will also be used by generations who will be educated later,

The teacher also has an educational effect if he notices inappropriate behavior of one student or group of students towards other students,

The teacher/professor also has an educational effect if he notices inappropriate behavior of the student towards him personally (inappropriate behavior that is not for taking disciplinary measures but needs to be corrected),

Letting and going to the toilet should not be done without the teacher's/professor's consent,

Group changes by students should be done with the teacher's approval,

Making micro pauses for e.g. student refreshment should also be under the strict supervision of the teacher and with his permission,

Special educational work should be applied to students who, during the lesson or "continuously" with their behavior, overemphasize themselves among other students.

Taking precaution of by applying organizational measures in classes

The organizational measures that the teacher takes in class are a very important means of preventing student injuries. The more experienced the teacher is (has a longer work experience), the easier it is for him to manage the students, the space of devices and aids, as well as the time allotted for teaching. It is considered that after 3 to 5 years of practical experience, the teacher can fully apply quality organizational measures. An example of appropriate injury prevention in this regard is:

Joint enactment and delivery of equipment and teaching aids with students, arrangement of equipment at the place of work and cleaning up after the work is completed, without endangering the safety of students. Students thus get to know the layout of devices and aids in the field. Devices and props should be placed at the optimal distance from each other in accordance with the tasks for students. It is necessary for the teacher to know which devices and aids will be used in which part of the lesson, on which the arrangement of devices or miseenscène in general depends. If the use of certain technical aids (video projectors, computers, etc.) is planned during the class, the same rule applies to them.

Professors/teachers should educate as many students as possible on how to properly handle all teaching aids used during classes, because by doing that the loss of active time in class is significantly shortened, but also the safety of work is increased so that students can notice possible irregularities which may have occurred on previously used aids.

It is important to choose the appropriate methodological and organizational form of work, especially in sports which require tasks with skipping, jumping, etc., where a moment of deconcentration and less attention can lead to injury to students or teachers. As an example, we can cite the organization of work where the teaching content in which there are elements of throwing, should be realized so that throwing is performed only on one side of the training ground and that all students go for thrown objects at the same time while providing optimal discipline.

In order for the realization of teaching contents, the teacher must check the temperature, lighting, the presence of dust and the like.

Special preventive measures are required by the realization of extracurricular teaching contents (excursions, tours, camps, visits)

Direct care for student

Direct care for students implies the presence with the student in the specific realization of a task which requires certain movement. These are usually more complex tasks that belong to more complex forms of movement. Immediate care can be performed by a teacher or other student who must be trained to perform immediate care. Otherwise, direct guarding achieves a counter-effect in the sense that both the student who realizes the moving task and the student who is in the role of guarding can be injured. Keeping students does not tolerate improvisation. Regardless of who is in the role of guardian, it is necessary to behave as follows:

Be as close as possible to the student during the exercise, the landing place or the place where there is the greatest possibility that the student will be injured by a fall during a failed task. If necessary, create a special place that is adapted to the role of storage and that allows for effective intervention.

Know well the moving task and the parts of the task in which a fall can occur. Often, the first signal of a possible fall is a wrong execution of the movement task technique, so that signal enables timely intervention.

The attitude of the teacher must be self-confident so that the student is not suggested the probability of a fall, because in that way the student would be discouraged in advance and lose self-confidence.

The role taken by the teacher must be such as to enable maximum mobility, so in practice the posture similar to the so called "Basketball defensive attitude" or an attitude similar to "boxing guard". But a big mistake is made when a guard kneels, sits, or takes a position that prevents him from reacting quickly in all different directions.

Note: In addition to knowing the measures of direct care of students, it is necessary to have some teacher experience in the implementation of care, which is gained through the passage of a certain amount of time spent in the teaching process.

Taking precaution by regular control of students' motor abilities

During the school year, the teacher must check the anthropological status of students (Rađo, 2000). The same is done at the beginning of the year by applying initial testing of students (morphology, motor skills, and functional status). Based on these indicators, a work plan and program is made, which is as close as possible to the students' abilities. In that way, the teacher will not ask the student to realize teaching

contents that are impossible or dangerous for him to realize (Belloc, 1972). In addition to the initial, a periodic check is applied, which can give the teacher a cross section of students' abilities and on the basis of which data he can change the plan and program made after the initial check. The change of the plan is done "if the abilities are lower - by applying simpler motor knowledge in the teaching process and vice versa. The final check in terms of increasing the safety of the teaching process does not play a significant role, nor does the ongoing check, since it checks the degree of acquisition of motor knowledge.

Keeping good knowledge of students by teachers

During the realization of physical education and health education classes, the teaching staff should not set motor tasks for the students that they suspect that the student can realize them. After a long work with students, the teacher gets to know the students well and can accurately determine whether the student is at the same level as in the previous classes (able to master a certain task for that class or not). The teacher has knowledge about all students based on exact data from the process of measurement and testing (Nikolić, 2003). However, there are other practical indicators that the teacher can observe on the student by observing. A student may come to class with fever, upset stomach, or other health problems that occurred just before class. By observing the student (changes on the skin, facial expressions, posture, behavior, etc.), the teacher can assume that certain disturbances have occurred, and by additional examination-conversation with the student (Brajša, 1994) can determine whether there is a need to take preventive measures to facilitate the student realization of the set tasks or completely prevent the participation of students in the class. Sometimes, even though the students insist on realizing the set tasks, the teacher is obliged to prevent them preventively.

Self-awareness of students

It implies that the student is trained to be aware of their own motor skills and what they can do and cannot do. This measure is very important for the "private life" of students, who should not engage in the implementation of various motor endeavors, if he realistically believes that he can successfully implement them. However, it can also find its place of application, self-preservation, in the teaching process. At the same time, the teaching staff must find a way for the student to have enough confidence in his knowledge, so that he undoubtedly approaches the realization of the set tasks.

The concept of helping

It allows for the first attempts to perform an exercise to overcome a number of problems that need to be addressed appropriately. The main problem is

reflected in the fact that, after the demonstration and explanation, it seems to the student that the movement is very simple and a total failure during the first attempt to perform, can be a serious shock and hindrance in further adoption of that and other movements. To avoid this, there is a valuable opportunity in the teaching process to assist in trying to accomplish moving tasks. When we talk about the application of help, then it is understood that the pedagogue, or more experienced trainer, includes his own strength as an additional external force that will facilitate the performance of the task. It is important that the help is provided by a pedagogue or a more experienced trainer, because it is not just about involving additional external force, but the application of that force must be controlled and adjusted to the effort (force) produced by the trainee himself. The teacher supports the process of movement by directing the movements of the trainees, orienting the student in time and space and thus successfully "together" realize the movement task. Helping should be effective, but the student should notice and feel it as little as possible. The student should be convinced that he performed the movement almost independently and that the help provided was almost insignificant. In that case, he does not lose the necessary self-confidence and the training process continues normally. The most unfavorable situation is when, despite the help applied, the task is not successfully completed. Basically, the reason for failure lies in the inexperience of the helper or when trying to realize a task that is beyond the student's ability. In addition for providing personal contact assistance, various technical aids can be used. No matter how valuable help is in the training process, it must be applied carefully and only to the extent if necessary. Excessive help does not develop students' self confidence, which can cause negative consequences and jeopardize the learning process.

The concept of assistance

Assistance is one of the special measures in which there is practically no contact between teachers and students while teaching content is being implemented. We apply assistance in the phase when the student has already completely mastered the element he is realizing and the role of the teacher is reduced to the presence in the immediate vicinity of the device or place of realization of the motor task. Knowing the exercise well, the teacher pays attention to the critical moments or parts of the exercise, when it is possible, that due to the complexity of the movement task, the student's contact with the device is lost. Only in the case of a student falling off the aids, the teacher intervenes and prevents a more severe form of injury because it is enough for an experienced student-trainee to get only the appropriate impulse to overcome the problem in which he found himself. Certain authors also call this measure psychological

help in the realization of the most complex teaching contents.

Order and discipline in class as a measure of preventive activity

It is implied that learning and exercising in all organizational forms of work in physical education and sports is realized in optimal working conditions. Then, the necessary work atmosphere and disciplined attitude of students towards work was established. When educating students, the teacher guides, warns and stimulates students by developing students' independence. However, if the educational work of teachers does not have an appropriate effect, disciplinary measures can be applied by imposing penalties and establishing prohibitions that should be appropriate to the situation. Accustoming students to work and discipline is an integral part of the process of learning and practicing, it must not be understood in any case as a restriction of freedoms and satisfaction of students. Disciplinary measures applied in school should lead to the suppression of undesirable behaviors in school, while being age appropriate and respecting the principle of ethical treatment of children. In teaching practice, there are so many possible "non-working" and "undisciplined" actions of students that it is not possible to overlook them all (Mirić, 2011), but with a good general organization of the teaching process, this number can be reduced. Students can e.g. come to class but not work / sit on the bench. The problems in imposing disciplinary measures in school are as follows:

The procedure for determining responsibility usually takes a long time.

There is a different treatment between teachers, who often selectively and differently apply the imposition of measures that are available to them.

A student is often punished, which is wrong because "behavior" should be punished, not the student.

The school has complex procedures for imposing disciplinary measures.

Note: The school evaluates the behavior of students in accordance with the Law on Primary Education.

Motivation and stimulation at work as a measure of preventive activities

Motivation and stimulation measures are based on stimulating students' natural biological need for research. The teaching of physical and health education satisfies the need and desire for movement, which also explores certain areas. The interest of students at a younger age shows variability, and the desire for the same can be stimulated by the word of the teacher who addresses the student. Motivational words addressed by the teacher to the student should

be appropriate to the student's current abilities. Verbal motivation can be used at the moment when it is most needed in terms of approval, praise, recognition for the task performed, corrections and the like. In order to develop the positive qualities of students, students who excel in learning and behavior and activities in school and outside, can be awarded praise and awards for the purpose of motivation. Praise can be given directly in class by the teacher but part of the praise and awards are given by certain school bodies. Official praise or reward of students is done in accordance with the "rules of the school" which represent the general act of the school. The rules of the school are adopted by the school board with the consent of the Ministry of Education. Commendations and diplomas, in addition to being awarded to individual students, can also be awarded to a group of students or a class for the results achieved in teaching and educational activities. Commendations, diplomas and awards are given publicly and are announced on important dates such as: school day, at the end of the semester, at the end of the school year and the like. Awards are given by: a class teacher for a student from I-IV grade, a class teacher for a student from V-IX grades, a class council, a teachers' council, a school principal and a school board. The reasons for awarding prizes to students can be the following:

Special results in the affirmation of the school in the implementation of the curriculum, municipal and cantonal competition,

Outstanding results in the competition at the federal and state level,

Commitment and outstanding success in various forms of leisure activities, in the social and cultural life of the school,

Exceptional contribution to the development of social relations and providing assistance to other students in mastering the curriculum, and other rewards.

The preventive purpose of all praise or rewarding of students is that the school has an additional member of the team who shows behavior in which responsibility is observed, and behavior that is an example for other students. In this way, the overall behavior of students in the school is stimulated and raised to a higher level (towards other students, teachers, school property, teaching process).

Prevention by applying the sign for increased attention

The pedagogue who implements the teaching process must acquaint all students with the sign for increased attention. The purpose of this sign is to be used for the purpose of general interruption of all activities. The same can be realized with e.g. a whistle that sounds in a specific way (a long and penetrating whistle). After this sign, which is usually not used more than two or

three times during the class, it is necessary that all participants in the teaching process stop activities (play, movement, conversation) and turn to the pedagogue. After this, the educator can proceed to a detailed explanation of his expectations. The sign can also be used in cases when students have lost control and started behaving outside all the rules, or in case of certain dangers for the student or students (e.g. in case a certain student finds himself in danger during outdoor classes) where after the use of the sign immediately suspends activities and thus eliminates the dangers.

Injury prevention or self-preservation of teachers /professors when working with students

A very important segment of prevention that is little or not talked about is the self-preservation of teachers/professors during the implementation of teaching content. For the teaching of physical education and sports, this segment is far more important than for other subjects. First of all, the realization of helping, guarding or assisting can lead to poor assessment or self-sacrifice and injury to teachers, all with the aim of preventive action to injure students. Also, poor organization of work in e.g. throwing athletic disciplines, or a moment of deconcentration and poor attention, or poor working conditions such as poor visibility can lead to injury. A very important segment of injury prevention is the well-developed awareness of the teacher about his current abilities, where in the implementation of demonstration methods, a moment of inattention or muscle weakness can lead to injury. Certain teaching contents are sometimes realized in field or other difficult conditions, so the recommendation for the teacher is to always perform quality preliminary preparation. Given that research has shown that a large number of sports educators are injured during competitions with students (especially high school), it is recommended not to engage in activities for which personal readiness has not been previously checked, playing basketball with students, taking students on hiking, school organization skiing on difficult trails, demonstration of motorically demanding sports techniques). It is important to note that teachers are expected to help students in moments of weakness, and not to let opposite situations happen, which can cause certain traumas for students, as well as be an interfering factor for further organization of teaching.

CONCLUSION

Sports injuries are usually characterized by numerous functional outbursts of the locomotor system. There may be minimal disability, but also the complete impossibility of realizing the content of physical education and health education. Such a situation is completely contrary to the immediate goals of teaching where it is necessary for as many students as possible

to participate in physical activity, in order to acquire exercise habits but also the necessary knowledge of sports techniques that could be applied in the so-called "free time" (Buntić, 2006). Due to the above, the prevention of injuries in the teaching process is one of the primary tasks, of course not to the extent that the entire teaching activity is reduced to the formal application "just so that students are not injured." A large number of injuries can be avoided by appropriate dosing of the load, but also by taking preventive measures in class. In theory, one can only assume how many injuries have been prevented (the number is imaginary and impossible to assume or investigate) by proper preventive action - by taking measures to prevent injuries in physical education classes. Since injuries do not have to be caused by extremely high mechanical external force, the application of proper technique is one of the most important measures in protecting students. Well self-awareness of knowledge reduces the chances of injury. It is recommended that all persons involved in physical education processes (professors, trainers, teachers) adhere to the rules developed in this paper, so that the exercise process is ensured and injury prevention is raised to a higher level.

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