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Study On The Effectiveness Of Using The Nage-No-Kata Programme To Increase The Technicality Index In Adolescent Judo Athletes

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Abstract

This study examines the efficacy of a Kata-based technical training programme in improving Judo technique execution. Conducted over eight months (September 27, 2021-April 27, 2022) at the Municipal Sports Club in Bucharest, the experiment involved 16 performance-level judokas with a minimum of five years of experience. A structured Nage-No-Kata programme was implemented three times weekly, with initial and final assessments evaluating Kata performance and competition technique (Ippon scoring). Wilcoxon test results revealed significant improvements ($p < 0.05$) in Kata execution ($W = 3.5$, $Z = -3.20$) and Ippon performance ($W = 0$, $Z = -3.51$), with effect sizes of 0.80 and 0.87, respectively, indicating a strong positive impact. The findings of this experiment on the use of the Kata tool in Judo sports training for enhancing technical proficiency show that competitive performance can be improved. However, limiting factors place this study in the position of a starting point for future research on this topic

Keywords: Judo Kata, Nage-No-Kata, technical training, sport performance

Introduction

Kata, in a broad sense, means "basic form". In Judo and other martial arts, Kata means the practice of the basics or the practice of what is in its traditional, pure form. While, on the one hand, in Randori (combat training) and Shiai (competition) it is about the realisation and execution of techniques in adverse situations, in Kata it is about their execution in the "ideal" form (Bocioacă, 2000). In Japan, Kata has been an important theme in any martial arts style since ancient times. As far as Judo is concerned, Kata really becomes of interest to other continents when competitions start to be organised. Kata competitions rise up to the level of World Championships, which are non-Olympic events in the sport of Judo. The desire to study Kata becomes stronger and stronger, which is demonstrated by the appearance of specialised works in several countries, even in Romania (Hantău & Bocioacă, 2002).

The supreme governing body of Judo, Kodokan, in the last 7 years, approves and even publishes several theoretical works that discuss this topic or at least have in its composition chapters relevant to this area of interest. The year 2019 represents the "pinnacle" of the literature on Kata as four of the most important specialised works are published: Formal Techniques - a complete guide to Kodokan Randori No Kata by Tadao Otaki and Donn F. Donn. Drageger (Otaki & Drageger, 2019), Nage No Kata by Alessio Oltremari, Formal Techniques - a basic guide to throwing and grappling by Tadao Otaki and Donn F. Drageger (Otaki & Drageger, 2019) and Nage No Kata, Katame No Kata by Edson S. Barbosa. The year 2020 is also a year of discovery as Bruce R. Bethers, President of the United States Jiu Jitsu Federation, publishes a volume entitled The Lost Kata of Kodokan Judodo (Bethers, 2020). This work makes an in-depth and unprecedented study of six ancient, virtually unheard of kata. Some of these were created by Jigoro Kano himself, and others by the first generation of his students or by the Kodokan leadership. Kata has spread in recent years as a necessity to supplement the technical training of athletes taking part in major competitions.

Methods

The experiment was carried out over a period of eight calendar months, from 27 September 2021 to 27 April 2022. The actual activity took place at Clubul Sportiv Municipal București, Bulevardul Ion Mihalache 162, Sector 1. The participating athletes fall into the category of performance athletes, with at least 5 years of experience in this discipline. They wear coloured belts, at least the green belt. In total, 16 athletes participated, organised in 8 pairs, selected according to height, weight and experience. The proposed training programme ran for 8 months, three times a week on Mondays, Wednesdays and Fridays. The duration of the programme on Mondays and Fridays was 30 minutes and on Wednesdays for 15 minutes. The 30 minutes included drills to perfect attack-defence procedures and situations. On Wednesdays, drills were performed to perfect movements, saluting (Ritsu Rei and Za Rei) and execution distances (Teodorescu, 2009).

Two types of tests were conducted in the experiment. The first test was carried out using a Nage-No-Kata referee sheet and illustrates the score obtained in the execution of the programme with all five groups, both initial and final. The second test was carried out according to the criteria for awarding the maximum score in the execution of a procedure in Judo competition: force and speed of execution, falling backwards, control and smoothness (Bocioacă, 2007). The research was carried out during the athletes' training sessions, with all participants at the same time. The initial/final Kata testing was conducted with a teacher, each pair having approximately 10-15 minutes. The second test was conducted under the same conditions, with approximately 6 minutes per pair. The participants took part in the experiment in a voluntary, respecting ethical principles, and they are informed that they can opt out at any time without repercussions. Data confidentiality was ensured (Predoiu, 2020).

Results

The results obtained in the experiment are presented in Tables 4.1 and 4.2 of the paper. For Nage-No-Kata, the mean score increased from 71.87 to 90 between the initial and final testing. For the maximum Ippon score, the mean increased from 100.25 to 128.06. Preliminary analysis of the data using an online calculator did not reveal any outliers. In the following, the main descriptive statistical indicators are presented: arithmetic mean, median, standard deviation and coefficient of variability. For the Nage-No-Kata test, the initial test had a mean of 71.87, median of 64.75, standard deviation of 33.93 and coefficient of variability of 0.30, and the final test had a mean of 90, median of 78.5, standard deviation of 33.87 and coefficient of variability of 0.30. For the Ippon test, the initial test had a mean of 100.25, median of 99.5, standard deviation of 28.15 and coefficient of variability of 0.28, and the final test had a mean of 128.06, median of 137, standard deviation of 18.95 and coefficient of variability of 0.18.

Table 1.

Descriptive statistics-participant results initial and final test

Indicators	**Test 1- initial test**	**Test 1- final test**	**Test 2- Initial test**	**Test 2- final test**
arithmetic mean	71,87	90	100,25	128,06
median	64,75	78,5	99,5	137
standard deviation	33,93	33,87	28,15	18,95
coefficient of variability	0,30	0,30	0,28	0,18

The Wilcoxon test was applied to test for differences between the baseline and final tests and was chosen due to the small number of participants (16). For Nage-No-Kata, the values obtained were $W = 3.5$, $Z = -3.20$, $p < 0.05$, and for Ippon, $W = 0$, $Z = -3.51$, $p < 0.05$, indicating significant differences in both cases. Effect sizes were calculated to demonstrate the impact of the training plan on technical execution. For Nage-No-Kata, the result obtained was 0.80, and for Ippon, 0.87, both values being greater than 0.25, according to Predoiu (2021), indicating a very strong positive effect.

Table 2.

Wilcoxon Wilcoxon value - Nage-No-Kata

Wilcoxon test indices	**Values obtained**
W	3,5
Z	-3,20
p	<0,05

Table 3.

Wilcoxon Wilcoxon maximum Ippon score

Wilcoxon test indices	**Values obtained**
W	0
Z	-3,51
p	<0,05

Kata is a set of movements intended to be performed as close as possible to the ideal form, in a predetermined programme illustrating specific combative principles. The primary function of Kata is to train the exact execution of techniques and the exemplary application of principles in a closed situation, in ritual form, over and over again in a repeatable manner. One of the most important elements in Judo is the "Kuzushi", or imbalance, which appears and is emphasised in all Kodokan Kata, including Nage-No-Kata. By utilising this element, techniques performed both in Kata and in competition will enjoy dynamism and efficiency. Nage-No-Kata is made up of 15 techniques, divided into 5 categories of 3 techniques each: Te Waza (arm techniques), Koshi Waza (hip techniques), Ashi Waza (leg techniques), Ma-Sutemi-Waza (backward sacrifice) and Yoko-Sutemi-Waza (side sacrifice). The main characteristics of all these techniques are the principle of attack and defence, the use of the opponent's strength and the principle of correct imbalance.

The results obtained in the experiment confirm that the implemented Kata programme has a major contribution in the development of Judo athletes' technique. According to authors such as Bocioacă, L. and Otaki, T., the non-olympic Judo Kata test is an important means of training for learning and perfecting the techniques used by athletes in competition. Thus, its use in training leads to the improvement of the execution in order to maximise the score (Ippon) and, at the same time, can lead to the maximisation of sports performance in competitions. Following the application of the Wilcoxon test, we find that there are significant differences

between the initial and final results in both Nage-No-Kata execution and in obtaining the maximum Ippon score. The effect sizes (0.80 for Kata and 0.87 for Ippon) indicate a very strong impact of the programme, with a greater effect on technicality in competition, suggesting effective transfer of Kata skills to real combat situations.

Kata competitions have become increasingly recognised in Europe and around the world, the most significant being the World Championships. In Kata the following competitions meet: National Championships, International Tournaments, European/World Cups and European/World Championships. These competitions are made up of several events, each couple may choose a maximum of two Kata. The evaluation is done on the basis of a judging sheet, looking at the component procedures, distance rules, positioning on the tatami and fluency. The types of mistakes encountered in Kata (major, major, medium, medium, minor) influence the scoring, with a major mistake (e.g. forgotten technique) reducing the score to zero for that technique and halving the total score. Romania has a long tradition in Kata competitions, with notable performances such as those of Ciprian Fleisz and Surlă Iulian, 4 times vice world champions and 5 times consecutive European champions in Nage-No-Kata.

However, the research was limited by several factors: the gender of the participants (only 6 males out of 16), age differences (12-30 years), the relatively small number of participants (16) and the training schedule (18:00-21:00), which could have generated unfavourable psychological states. These limitations suggest that the results can be considered as a basis for future studies that rule out such disturbing factors. A future direction could be to apply the programme in larger groups (30-50 participants) and to conduct a test in sports competitions to concretely observe the athletes' possibilities to accumulate the maximum score (Ippon).

Conclusions

The results obtained in the experiment confirm that the Kata programme implemented has a major contribution in the development of Judo athletes' technique. The non-olympic event of Judo, Kata, is an important means of training for learning and perfecting the techniques used by athletes in competition. Its use in training leads to improved execution for maximum scoring (Ippon) and can maximise sports performance in competition. The aim of the research was to identify the optimal methods and means of Kata technical training, which would facilitate the elaboration of a technical training plan in order to improve the execution of the procedures and technical elements in Judo, an objective achieved by the programme applied over 8 months.

Due to the fact that Judo is a discipline with a multitude of techniques, over the years specialists have classified and organised the techniques according to several criteria. One of the most widely used classifications is the Go-Kyo, by Jigoro Kano, based on the body segment with which the final thrust of the opponent's throw is made. This includes Tachi-Waza (standing throws) and Sutemi-Waza (sacrificial techniques), along with Ne-Waza (ground techniques). Another classification, Kawaishi, divides the techniques into Nage-Waza and Katame-Waza. The Romanian specialists have made a classification that follows the principle of making the content accessible, starting with the ground techniques (e.g. Kesa Gatame) and then moving on to the standing techniques, divided into six levels of study with 46 techniques. These classifications emphasise the importance of a systematic approach to the learning of techniques, which is also reflected in the Kata method.

The regulations for the DAN grade exam, evaluated by the National Commission of Black Belts of the Romanian Judo Federation, emphasise the role of Kata in the progression of athletes. Candidates must demonstrate mastery of technique, understanding of principles and acquisition of the spirit of Judo, Kata being an essential test (e.g. Nage-No-Kata for DAN 1-4). The implemented programme has captured the most beneficial exercises in Nage-No-Kata, which can be used to improve technical execution, providing a solid basis for future practical applications and extensive research.

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The Role Of Students' Emotional And Behavioral Status In Sports Performance

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Abstract

The present study explores the influence of emotional and behavioral status on sports performance among students. The relationship between the emotional state and the behaviors associated with sport is complex and bidirectional, influencing the levels of motivation, concentration, resilience and team cohesion (Ionescu, 2018). Thus, it is essential for coaches and teachers to understand these dimensions in order to optimize sports training and support the personal development of students. The paper brings into discussion various theoretical models and empirical research that highlight the role of emotional states in sports performance, providing recommendations for effective interventions.

Keywords: emotional status, sports behavior, sports performance, students, motivation, training

Introduction

Sport is an important dimension of student development, having benefits not only on physical health, but also on psychological and social development. The emotional and behavioral status of young people significantly influences their sports performance. Emotional states such as anxiety, self-confidence or stress can affect athletes' concentration and motivation, while adaptive or maladaptive behaviors can influence competitive results (Ionescu, 2018).

Students' emotional status and impact on sports performance

Emotional status refers to the psychological states that a student may experience before, during, or after a sporting activity. Research has shown that emotions can directly or indirectly affect athletic performance (Weinberg & Gould, 2018). For example, performance anxiety can lead to decreased self-confidence and motor efficiency (Jones, 1995).

Anxiety and stress

Anxiety can have both negative and positive effects on performance, depending on the athlete's ability to manage their emotional states (Martens, Vealey & Burton, 1990).

Self-confidence and motivation

High levels of self-confidence have been associated with better athletic outcomes, due to increased motivation and a tendency to exert more effort (Bandura, 1997). Intrinsic motivation is essential for maintaining athletic engagement, especially in team sports (Deci & Ryan, 1985).

Methods

Students' behavior in a sports context

Students' behaviors during training and competitions can influence the team atmosphere and final results. Aggressive or uncooperative behaviors can lead to conflict and a decrease in team cohesion (Carron, Brawley, & Widmeyer, 1998). Students' behavior during sports activities plays a crucial role in determining their performance and team success. The behaviors manifested in training and competitions influence the team dynamics, the motivation of colleagues and the general atmosphere, having an impact both individually and collectively. Behaviors can range from positive behaviors, which support the development of athletic performance, to negative behaviors, which can hinder progress.

Adaptive behaviors

Adaptive behaviors are those that contribute positively to sports activity, such as constant effort, discipline, responsibility and cooperation with teammates and coaches. These behaviors are essential for long-term success in sports, as they facilitate skill learning, keep morale high, and foster team cohesion. Students who demonstrate positive behaviors, such as hard work and respect for peers, contribute to more effective team dynamics and superior performance (Jowett & Cramer, 2010).

Maladaptive behaviors

Problematic behaviors, such as aggression, lack of discipline, or avoidance of effort, can affect not only individual performance, but also team morale (Smith, Smoll, & Cumming, 2007). Maladaptive behaviors are those that can negatively affect sports activity, such as lack of discipline, aggressiveness, non-cooperation and avoidance of effort. These can not only negatively influence students' performance, but also team dynamics, creating tensions and conflicts within the group. For example, a student who exhibits excessive aggression can disrupt team relationships, leading to decreased team cohesion and performance (Smith, Smoll, & Cumming, 2007).

Maladaptive behaviors can be based on factors such as performance anxiety, lack of self-confidence, or previous negative experiences in sports. Thus, it is important for coaches and teachers to identify and correct these behaviors through appropriate intervention strategies, such as psychological counseling or relaxation techniques (Weinberg & Gould, 2018).

The role of coaches and teachers in shaping behaviors

Coaches and teachers play a critical role in influencing student behavior by shaping desired behaviors and providing constructive feedback. The leadership style adopted by

coaches can influence students' motivation as well as their attitude towards sports. Leaders who promote a positive motivational climate oriented towards personal development are associated with students who exhibit adaptive behaviors and a positive attitude towards athletic effort (Deci & Ryan, 1985).

Theoretical models regarding the relationship between emotional status and sports performance

There are various models that explain how emotions influence athletic performance, including the multidimensional model of anxiety and the theory of perception control (Jones, 1995).

To understand how emotional status influences sports performance, researchers have developed several theoretical models. These models offer different perspectives on how emotions and psychological states influence athletes' performance and behaviors. Among the most widely used models are the multidimensional anxiety model, the inverse activation state theory, and the flow state model.

The Multidimensional Model of Anxiety

This model suggests that cognitive and somatic anxiety have different effects on performance, depending on their intensity and perceived direction (Martens et al., 1990). The multidimensional model of anxiety (Martens, Vealey & Burton, 1990) proposes that anxiety can be divided into two main components: cognitive anxiety and somatic anxiety.

- Cognitive anxiety refers to negative concerns and thoughts about performance, such as fear of failure or excessive self-criticism. This is often associated with decreased performance, as it can distract the athlete from the main task.
- Somatic anxiety, on the other hand, refers to the physiological symptoms of anxiety, such as muscle tension, sweating, or rapid heartbeat. The impact of somatic anxiety on performance can be either positive or negative, depending on the athlete's interpretation. If the symptoms are perceived as a normal activation reaction, they can improve performance by increasing energy levels.

The model suggests that both the intensity of anxiety and its direction (whether it is perceived as helpful or harmful) are essential for athletic performance.

Inverse theory of the activation state

The inverse theory of the state of arousal, developed by Kerr (1997), proposes that the relationship between arousal and performance is not linear, but depends on the subjective

interpretation of the athlete. According to this theory, the same state of arousal can be perceived as pleasant or unpleasant, depending on the context and the athlete's previous experiences. According to the theory, athletes who perceive increased activation as pleasurable will perform better, while those who perceive it as unpleasant will experience decreased performance. Thus, the subjective interpretation of the activation state is a crucial factor in determining its effect on performance.

Flow state model

The flow state, a concept introduced by Mihaly Csikszentmihalyi (1990), describes an optimal psychological state characterized by total involvement in the activity, loss of self-awareness and an intense focus on the task. In this state, athletes experience a sense of total control and harmony between the demands of the activity and their abilities. The conditions necessary to achieve the flow state include setting clear goals, immediate feedback, and a balance between the challenges of the task and the athlete's abilities. The flow state is associated with maximum performance and high satisfaction in sports activity. When students are able to enter this state, they can improve their performance and have a more enjoyable sports experience.

Theory of perception control

Perception control theory (Carver & Scheier, 1981) is a psychological model that explains how people regulate their behavior to achieve desired goals. According to this theory, people act to reduce discrepancies between what they currently perceive and what they want to achieve, relying on a continuous feedback system that allows them to adjust behavior according to their progress.

The theory assumes that individuals constantly monitor their performance and compare it to an internal standard or goal. Emotions arise as responses to differences between current performance and proposed goals (Lazarus, 2000):

- Positive emotions arise when progress is perceived as being consistent with or faster than expected. For example, an athlete who achieves their performance goals may feel joy and satisfaction, which helps to increase self-confidence and motivation.
- Negative emotions arise when there are large discrepancies between desired and actual performance, especially if progress is slower than expected. This can lead to frustration, anxiety, or even demotivation.

Feedback mechanism and self-regulation

Perception control theory is based on the idea that individuals use a feedback mechanism to assess differences between set goals and actual performance. The system works like this:

- **Goal setting:** Students or athletes set clear performance goals (e.g., to reach a certain time in a race or improve a specific technique).
- **Performance monitoring:** They constantly monitor their progress towards these goals.
- **Comparison with standards:** Current performance is compared to set goals. If there are discrepancies, an emotional response is generated.
- **Behavior adjustment:** Depending on the assessment of progress, students may choose to adjust their behavior to reduce discrepancies and get closer to goals.

Implications in sport

In the sports context, the theory of perception control is relevant because sports performance often involves setting goals and self-regulating behavior to achieve them. Athletes who can effectively monitor their progress and learn to interpret feedback in a constructive way are able to adjust their behavior to achieve better results. Coaches can also use this theory to help athletes set realistic goals and manage the emotions that arise during achieving those goals. By encouraging constant evaluation and continuous adjustment of behavior, athletes can develop self-regulation skills that help them improve their performance.

Perception control theory provides a clear explanation for how emotions influence sports behavior and performance. Positive and negative emotions can serve as cues for self-regulation, helping athletes adjust strategies and overcome obstacles to achieve their goals. Understanding this process can contribute to the development of effective interventions that support athletes' progress and improve sports outcomes (Hanin, 2000).

Results

Recommendations for improving sports performance by managing emotional status

Psychological interventions, such as relaxation techniques, mental training, and positive feedback, can be useful for managing emotional states and behaviors among student athletes (Weinberg & Gould, 2018).

Effective management of emotional status can have a significant impact on sports performance, influencing both the psychological states of athletes and their behaviors during competitions. Below are some essential recommendations for improving performance through emotion management strategies.

Development of emotional self-regulation skills

Athletes should learn to monitor and regulate their emotions effectively. Emotional self-regulation involves recognizing emotions that arise before and during competitions and using strategies to manage them. Techniques that may be helpful include:

- Controlled breathing techniques: These can help reduce anxiety and improve concentration. For example, deep, rhythmic breathing can calm the nervous system and reduce tension before a sporting event.
- Positive visualization: Athletes can practice visualizing success, imagining in detail how they achieve the desired performance. This can help boost self-confidence and reduce anxiety.
- Mental training: It involves psychological preparation through relaxation techniques and mindfulness meditation, which can help athletes to be more present and cope better with pressure.

Setting realistic and motivational goals

Well-defined and realistic goals are key to improving performance. Objectiverlr can be temporal and measurable:

- Short-term and long-term goals: Athletes should set both immediate goals, which are easy to achieve and provide quick satisfaction, and long-term goals, which are challenging and help increase motivation.
- Measurable and specific goals: These help monitor progress and allow behavior to be adjusted based on results. For example, "improving running time by 5 seconds" is more specific and measurable than "running faster."

Promoting a positive attitude and resilience

To face challenges and overcome failures, athletes must develop a positive attitude and resilience. This can be achieved by:

- Reframing negative thoughts: Athletes should learn to replace negative thoughts with positive affirmations and see mistakes as learning opportunities. For example, instead of thinking "I failed," focus on "I can improve on the next attempt."
- Cultivating resilience: Through workouts that include simulating difficult conditions, athletes can learn to stay calm and stay focused even in high-stress situations (Hardy & Jones, 1994).

Use of integrated psychological training

Psychological training should be an integral part of sports training, not just a separate element. Techniques such as goal setting, mental training, and relaxation should be combined in physical training sessions. This helps athletes apply emotion management strategies in contexts similar to those during competitions.

Social support and coach involvement

Coaches play an essential role in the emotional development of athletes. By providing constructive feedback and supporting athletes during difficult times, coaches can help boost self-confidence and manage stress. In addition, social support from teammates can positively influence the emotional state of athletes, giving them a sense of belonging and support.

Emotional education

Introducing emotional education into sports training can help athletes develop a better awareness of emotions and their impact on performance. Courses or seminars on stress management, emotion recognition and coping techniques can bring significant benefits in sports (Gavrilă-Ardelean, 2016).

Proper management of emotional status is essential for improving sports performance. By implementing emotional self-regulation techniques, setting motivational goals, promoting resilience, and integrating psychological training, athletes can optimize their performance and have a more positive and satisfying sports experience (Runcan, Runcan, Goian, Nadolu & Gavrilă-Ardelean, 2020).

Conclusions

The relationship between emotional status, student behaviors and sports performance is complex and requires an in-depth understanding to optimize sports training. Coaches and teachers should implement intervention strategies that support emotion management and encourage positive behaviors, in order to maximize students' sports performance and personal development.

Students' behaviors in a sports context have a significant impact on team performance and cohesion. Understanding and managing these behaviours through interventions and support provided by coaches can help maximise students' sporting potential and develop essential social skills.

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Improving The Methods Of Training And Selection Of Female Handball Players

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Abstract

The theory and methodology of physical education and sports is the science that studies the laws of physical education and sports. Handball is a means of physical education, because it contributes to improving health, harmonious physical development, the development of motor and mental qualities, as well as the acquisition of motor skills. In order to achieve high results, it is necessary to practice it within sports teams in which the training work must be well planned and carried out on a scientific basis. The road to the heights of sports mastery is difficult, requires a lot of work and very careful and, above all, continuous training. However, mastery is achieved faster than in other sports games. The purpose of this work is to develop and experimentally implement a training program that includes proprioceptive means, oriented towards optimizing the means of training and selection of players for the game of handball, juniors III, in order to maximize the use of performance skills. The results obtained in the physical assessment are very good, which indicates that, in the physical training and selection process, means and exercise structures appropriate to the children's age were used.

Keywords: motor qualities, methods, means, physical training, program.

Introduction

The game of handball is in a continuous development , recording a dynamic of improvement continue , whether it is words about activity Competition or the training one , there is always one more element much or may little absolutely innovative , the game being update and permanently adapted to the parameters superiors , thus improving and FORWARD continuously (Alexe Nicu, 2002).

primary reason why I chose this topic consists in the fact that one of the trends Actuator is introduction into the framework training programs for some means specific , with character proprioceptive , having as its objective A better index specific neuromuscular coordination and static balance and dynamic from an early age early (Bompa Teodor O., 2001).

From a theoretical point of view, the work highlights proprioceptive means for the purpose of optimizing the means of training and selecting players for the game of handball, juniors III, women's handball (Bota Ioan. Maria Bota, 1987).

The present work aims to develop and experimentally implement a training program that includes proprioceptive means, oriented towards optimizing the means of training and selection of players for the game of handball, juniors III, in order to maximize the performance skills (Cârstea G., 1993).

Each sport branch has a specific content of general physical training, an aspect determined by the factors necessary for practicing the sports branches, namely the dominant motor qualities, the necessary motor skills and habits. (Simion G. Stănculescu G., Mihăilă I., 2011, P.119).

Defensive play requires superior physical training. This is due to the fact that the rhythm of the game is set by the attacking team, and the defending team must adapt to this rhythm. Another factor that supports this idea is that the ball moves faster than the players (Cârstea, Gh., 1999) .

The factors underlying handball training are (Colibaba, DE, Bota, I., 1998) :

- *physical training* - general and specific;
- *technical training* - learning, consolidating and improving technical elements;
- *tactical preparation* - execution of technical elements in conditions of collaboration with teammates and opposition from opponents, in order to obtain superior performance;
- *psychological preparation* – approaching the competition in optimal psychological conditions;

- *theoretical and methodological training* – acquiring specific knowledge and information regarding the rules of the game, organizing competitions, the history of the handball game, exercise hygiene, recovery after exercise.

These factors, which influence each other, are directly related to the degree and level of training of each team (Dragnea A., Bota A., (1999) .

The theory and practice of sports training show us that (Dragnea Adrian, 2006) :

- learning, consolidating and perfecting technical elements requires a large volume of activity;
- the intensity of effort is the factor that favors the body's adaptation to specific physical demands;
- The complexity of the means used contributes to the specific training of players, which is achieved by transposing them into conditions as close as possible to those of the game.
- The game of handball requires players to move correctly on the court, to be precise in handling the ball in order to collaborate with partners in a limited and crowded space, through simple and complex movements, with and without the ball, executed with great skill and speed.
- Handball requires players to have technical and tactical knowledge and skills, equally for both attack and defense.
- The technique of the handball game is composed of the following elements: movements, catching, catching and passing the ball, dribbling (driving) the ball, deceptive movements (slits), defensive game technique.

The individual tactical elements of the handball game are: marking and marking, marking being of two types, direct and indirect, penetrating, overcoming and recovering the ball.

In the game of handball, tactics involve strategies and game plans used by the team to gain an advantage over their opponents (Dragnea A. Teodorescu-Mate S., 2002).

The most important elements of tactics in handball include:

- *Defense system* : The team can opt for different types of defense, such as individual or zonal defense. This depends on the characteristics and skills the players on the team and the tactics opponents ;

- *Offensive system* : the team can use different attacking strategies to score goals, such as combination play, fast counterattacks or positional attacks. It is important for players to be coordinated and work together to overcome the opponents' defense;
- *Set plays:* teams can use pre-prepared plays to create scoring opportunities, such as free kicks, plays from the edge of the field, or combinations of passes and movements;
- *Player rotation* : the coach decides how to rotate his players on the field to maintain the balance between attack and defense, as well as to manage the team's physical resources;
- *Adaptability:* During the match, the team must be able to adapt to changes on the field and adjust tactics according to the opponents' evolution or any problems encountered during the game.

Motor skills, also called physical skills, are not acquired during an individual human existence (Gheorghe, C., 2000). The game of handball is based on all four motor skills, which manifest themselves under certain characteristics (Tudor, V.,1999) :

- speed of execution, movement, and reaction;
- general and specific skill;
- general, specific resistance, and resistance in terms of strength, speed, and skill;
- explosive strength in the upper and lower limbs (detenta).

The main motor quality that dominates in the game of handball is resistance in different regimes, more precisely: in the regime of strength, speed, technique (skill).

Methods

The hypothesis

By developing and using a modern system for optimizing the training and selection of handball players, as well as programming training activities based on specific forms of training and specific directions of action, they will contribute to achieving superior sports results.

Work methodology

This work was carried out in the following stages:

a) The general stage – consisting of two parts:

- establishing the theme and objectives as well as the working methodology;
- formulating the hypothesis.

b) The particular stage – the previously formulated hypotheses are demonstrated, concretely acting on the objectives through the use of working methods and techniques.

c) Conclusions stage – the desired result from scientific research is obtained, which will represent agreement based on truth or disagreement, in case of error.

Therefore, this work was carried out in the form of an experiment taking place in the "Arad Municipality" and the Bujac neighborhood, respectively, within the "High School with a Sports Program". This experiment was carried out under the supervision of the handball coach of the "Inoan Arad Sports Club" in the 2023-2024 academic year.

The subjects participating in this experiment were 6th grade students from the middle school cycle, 10 boys and 10 girls.

Period and date of the experiment

The experiment was carried out in the form of tests, namely: initial and final testing.

Therefore:

1. Initial testing was carried out in November 2023;
2. The final testing took place in March 2024.

Following the tests carried out, some aspects were analyzed, and the results obtained were processed and interpreted statistically.

The exercises I used for the development of movement speed, explosive strength of the lower limbs and joint mobility as well as their dosage, were the following:

Developing 5 and 10 m running speed (exercises distributed on Mondays, Wednesdays and Fridays):

- Variable distance sprint:
    - 5-10 m; 2 x (4 x 5m) – 1' break between repetitions and 2'-3' between sets;
    - 2 x (4 x 10m) – 1' break between repetitions and 2'-3' between sets;

Developing explosive strength of the lower limbs (exercises distributed on Mondays, Wednesdays and Fridays):

- Jump squats :
    - 4 x 15 repetitions – 1'30" break between repetitions;
- Jumping over obstacles :
    - 3 repetitions – 1'30" break between repetitions.

Developing mobility of the hip and ankle joint (exercises distributed on Mondays, Wednesdays and Fridays):

- Peak climbs ;
    - 4 x 15 reps – 1' break between reps
- Hyperextensions on the ground;
    - 4 x 15 repetitions – 1' break between repetitions and 2 ' between sets.

Research methods use in the development Job

The following research methods were used in the development of the paper (Gagea A., 2010) and (Ștefan Tudos, 2000):

- Bibliographic study;
- Observation method;
- Morpho-functional measurements ;
- Assessing the level of motor training ;
- Experimental method ;
    - Statistical and mathematical method of data processing.

Results

Statistical data performance represents the result of research in which a test variable is found to be the mediating factor through which an independent variable influences a dependent variable.

The results that were obtained from the experiment are entered in the tables below and are also represented graphically.

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The results that were obtained from the experiment are entered in the tables below and are also represented graphically.

Table 1.

Anthropometric evaluation - initial testing

Subjects	Year Birthday	Sex Female	ANTHROPOMETRIC EVALUATION – Initial testing				
			Waist	Weight	Bust	Wingspan	Length STATES lower
1	2008	F	153	42	70	153	90
2	2009	F	143	35	63	140	85
3	2009	F	157	37	67	147	98
4	2008	F	148	44	76	139	90
5	2009	F	145	40	72	134	88
6	2008	F	160	39	69	155	100
7	2009	F	139	48	81	130	82
8	2009	F	155	46	80	146	95
9	2008	F	140	35	62	135	83
10	2008	F	162	43	64	156	102
Arithmetic mean			150.2	40.9	70.4	143.5	91.3
amplitude			23	13	19	26	20
Standard deviation			35.8900172	8.63347	15.3845	33.4542	20.6522

Coefficient of variability	33.5731277	31.7302	32.1963	33,171	32.7028

Table 2.

Anthropometric evaluation-final testing

Subjects	**Year Birthday**	**Sex Female**	**ANTHROPOMETRIC EVALUATION – Final testing**				
			Waist	**Weight**	**Bust**	**Wingspan**	**Length STATES lower**
1	2008	F	158	45	80	157	96
2	2009	F	149	40	67	145	89
3	2009	F	163	42	72	151	103
4	2008	F	154	50	85	144	97
5	2009	F	150	44	74	138	93
6	2008	F	167	48	73	158	105
7	2009	F	144	52	87	135	90
8	2009	F	161	52	81	152	103
9	2008	F	150	43	67	139	92
10	2008	F	168	54	75	162	110
Arithmetic mean			156.4	47	76.1	148.1	97.8
amplitude			24	14	20	27	21
Standard deviation			37.2819736	10.04261752	16.6329	34.4238	22.0989
Coefficient of variability			33.5363312	31.89292401	32.2062	33.1267	32.6936

Analyzing the results in Table 1-2, during the 2 tests, respectively the initial and final, the results obtained for waist measurement, we found that at the end of the school year, following the results obtained in the final test, there was an increase in terms of waist than in the initial test.

And from the point of view of body weight, the results in Table 1 show that during the 2 tests, respectively the initial and the final one, the results obtained for the measurement are within the parameters.

Analyzing the results in Table 1-2 during the 2 tests, respectively the initial and final one, the results obtained for the bust measurement showed an increase in the final test compared to the initial test.

The results in Table 1-2, during the 2 tests, respectively the initial and the final one, the results obtained for measuring the span and length of the lower limbs showed an increase in them.

Table 3.

Physical assessment – Initial testing

			PHYSICAL EVALUATION - Initial testing				
Subjects	**Year Birthday**	**Sex female**	**50m sprint flat (start from top)**	**Standing long jump**	**Endurance running 600m**	**DISPOSAL sheep's balls**	**Mobility of the scapulohumeral joint (rotating helmet)**
1	2008	F	10.5	128	3.12	12	78
2	2009	F	9.8	150	3.25	17	80
3	2009	F	9.9	140	3.17	13	92
4	2009	F	9.6	142	3.15	16	85
5	2008	F	9.7	138	3.10	18	83
6	2009	F	11.5	130	3.19	20	87
7	2008	F	10.7	148	3.09	22	91
8	2009	F	11.1	135	3.06	15	90
9	2008	F	12.6	153	3.11	14	88
10	2008	F	10.9	155	3.21	19	79
Arithmetic mean			10.63	141.9	3,145	16.6	85.3
amplitude			3	27	0.19	10	14
Standard deviation			2.26322947	32.7881	0.81835	3.32077	20.1993
Coefficient of variability			31.8670284	33.0323	35,127	30.8986	33.4226

Table 4.

Physical evaluation – Final testing

Subjects	Year Birthsday	Sex female	PHYSICAL EVALUATION - Final testing				
			50m sprint flat (start from top)	Standing long jump	Endurance running 600m	DISPOSAL horse balls	Mobility of the scapulohumeral joint (rotating helmet)
1	2008	F	9.6	132	3.8	18	86
2	2009	F	9.4	154	3.21	24	84
3	2009	F	9.1	144	3.13	20	96
4	2009	F	9.2	146	3.11	21	89
5	2008	F	9.3	142	3.6	25	87
6	2009	F	8.9	134	3.15	27	94
7	2008	F	7.8	152	3.5	29	99
8	2009	F	9.7	140	3.2	22	94
9	2008	F	9.8	160	3.7	19	93
10	2008	F	7.9	162	3.17	26	85
Arithmetic mean			9.07	146.6	9.07	23.1	90.7
amplitude			2	30	2	11	15
Standard deviation			2.04573727	33.4253	2.04573727	4.61076	21.3952
Coefficient of variability			32.6622753	32.8284	32.6622753	30.9838	33.3635

Analyzing table no. 3 -4, during the 2 tests, respectively the initial and the final one, the results obtained regarding the 50m speed running (50m sprint), the results had a positive evolution, as follows:

- from an average of 10.63 at the initial test, 9.07 at the final test, a decrease of 1.56 resulted between the initial and final test.

Analyzing the results in table no. 3-4, during the 2 tests, respectively the initial and the final one, the results obtained regarding the standing long jump , the results had a positive evolution, as follows:

- at an average of 141.9 at the initial testing, 146.6 at the final, resulting in an increase of 4.7 between the initial and final testing.

Analyzing the results obtained in table no. 3-4, during the 2 tests, respectively the initial and the final one regarding the results achieved in the 600m endurance running test , the results had a positive evolution, as follows:

- the study, from an average of 3.145 at the initial testing, 9.07 at the final one, resulted in an increase of 5.92 between the initial and final testing.

Analyzing the results in Table No. 3-4, during the 2 tests, respectively the initial and the final one, the results achieved in the ball throwing test , the results had a positive evolution, as follows::

- The study, from an average of 16.6 at the initial testing, 23.1 at the final, resulted in an increase of 6.5 between the initial and final testing.

Analyzing the results obtained in table no. 3-4, during the 2 tests, respectively the initial and the final results obtained for measuring the mobility of the scapulohumeral joint , the results had a positive evolution, as follows:

- The experiment, from an average of 85.3 at the initial testing, 90.7 at the final, resulted in an increase of 5.4 between the initial and final testing.

Conclusions

Following the study, we identified the following aspects:

- the implementation of the physical training process is conditioned by several determining factors, these being:
- health status;
- physical development;
- motor skills and mental qualities.
- improving performance in the game of handball is closely linked to increasing the training factor and not only that, and learning, consolidating and perfecting technical elements is achieved through a large volume of activity.

Therefore, through the research tests, the following parameters were evaluated: body structure, lower and upper limb strength, specific energy. Therefore, in the anthropometric evaluation, for the 5 samples, high results were obtained with major differences between the two tests, initial and final.

The results obtained in the physical evaluation are very good, which denotes the fact that, in the physical training and selection process, means and exercise structures appropriate to the age of the children were used. The physical evaluation provided very good results also because the physical training focused on the most valuable technical-tactical methods of the handball game.

In conclusion, the main purpose of this research was to determine the effect of training on the physical preparation of a group of junior handball players II. At the same time, applied physical training contributes significantly to improving the sports performance of handball players, and the purpose of the experiment was achieved through this physical and technical-tactical preparation.

Therefore, following the experiment and the results obtained, we found that the most important thing in teaching children is to ensure good physical, technical and tactical preparation. Concluding the results obtained in this scientific paper, we can say that its working hypothesis has been confirmed.

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Educational, Sports, Cultural and Solidarity Tourney: from the point of view of the Sports Organization

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Abstract

The practice of organizing sports events is a new area of research and therefore requires further studies. The objective of this study was to identify events that have different values and characteristics from traditional sports competitions. To this end, a survey of information about these events and an interview with the organizing committees of these events were carried out. The study was guided by qualitative research, of a descriptive and interpretative nature, involving interviews and documentary research of the events selected for the study. After reading the data, information was gathered to better understand the values of the Educational,

Sports, Cultural and Solidarity Tournament (TECSESP). As a result, we found that there is a sports organizational model for holding this event, the organizing committee of TECSESP that seeks to promulgate values that are passed on through the actions of participants and organizers. Because the event is held periodically, it has been structuring itself and seeking to be increasingly aligned with its target audience in a process of collaboration.

Keywords: Events; Sports Organization; Solidarity Tourney; Sport.

Introduction

Tubino (2017) initially highlights that "sport is considered one of the most important sociocultural phenomena at the end of the 20th century". Firstly, the beginning of the organization of sporting events stands out in Ancient Greece, with the Olympic Games, evidencing the warlike, political, festive and religious practices of the Greeks, as a way of making the citizens of the Polis feel like “one”. Later, in Ancient Rome, the Romans, by appropriating Greek culture, held religious games in the great circuses and amphitheaters of the cities, on sacred feast days and holidays, with the aim of “calming” and entertaining patricians and plebeians, to alleviate social tensions. This policy was known as the policy of Bread and Circuses, and aimed, during the period of the Republic, to demonstrate great spectacles, creating a period of pacification between the aristocracy and the people. In other words, such sporting events have been present in society for many years and are commonly linked to objectives and purposes of construction around a message to be conveyed in line with the sporting event. Thus, it is important to organize such events so that they are carried out within the proposed objectives.

Given this panorama and taking a historic leap in the evolution of sporting events, it is necessary to organize sporting events mediated by professionals who have specialized knowledge in the act of managing or administering these events. The terms management and administration are complementary to each other, with the latter being the one that is more disused today in the 21st century in the academic field. According to Ferreira (1988), the meaning of the word management is associated with managing, administration, and administration. Therefore, the administrative and sports areas become highly relevant for study and knowledge, in order to make the various types of events with different purposes viable. With the union of these areas, a new concept emerges, which is sports management. According to Bateman and Snell (1996), sports management is the area that will carry out processes of working with people and material resources in order to optimize the objectives of sports organizations in an effective manner.

Understanding that sports management is an area of relevance and that sports events have objectives: political; social; health and economic, involving various areas, this work will seek to elucidate such issues surrounding the organization of sports events such as the Educational, Sports, Cultural and Solidarity Tournament of the Technical School (Etec) of Esports – TECSESP.

TECSESP, a social event held in the form of a tournament, is organized annually by students and directors of the Curt Walter Otto Baumgart technical school, better known as Etec of Sports. The event is systematized and organized by students of the Technical Course in Sports Organization and the school community. This tournament is intended for the participation of students from the state education network of Centro Paula Souza, an agency of the Government of the State of São Paulo, responsible for promoting a network of higher education technology courses lasting two to three years.

This event is held in the form of a tournament, and according to Poit (2013), the tournament is characterized by an elimination competition in which there is no confrontation between all teams because it is held in a short space of time. This event is characterized by an event (party, sports competition, show) planned with a specific place and time, which attracts a large audience. Finally, TECSESP is a tournament that is inserted in the educational context, being aimed at different Etec´s in the State of São Paulo, which get involved and mobilize for effective participation in the event.

TECSESP aims to be an educational, cultural and solidarity tournament, with these tree pillars as a message to be conveyed to participants. Therefore, it is of utmost importance that these concepts are clear to those who organize and those who experience the event. According to Michaelis (2023), educational is something related to education, educational and scholastic is something related to the school that is intended for the school; suitable for use in school; that is specific to the school. Regarding culture, according to Santos (1983), culture concerns humanity as a whole and at the same time each of the peoples, nations, societies and human groups. Finally, Michaelis (2023) defines solidarity as something that depends on one another; reciprocal; that is willing to support, help, accompany or defend someone in a given situation.

Therefore, by understanding the area of study and complexity of sports management and the dimension of the TECSESP event, this study aims to diagnose the occurrence of events that have different values and characteristics from traditional sports competitions, which are those that emulate the principles of high-performance sports, and whether they can demonstrate such characteristics in the design and execution of these events. With this as a guide, the research will conduct a survey of tournaments similar to TECSESP and also interview organizing committees of these events, seeing if what is proposed as a mission is in fact executed in such organizational models of events with an Educational, Sports, Cultural and Solidarity character.

Methods

This research work is qualitative in nature. Qualitative research is that which is concerned with studying phenomena in greater detail. According to Cauduro (2004), qualitative research seeks to understand the concepts, attitudes, behaviors, opinions and attributes of the universe being researched, seeking to relate such aspects assessed through the responses of the research subjects through research, observation and documentary study.

The present research proposes to carry out the following procedural steps:

- 1st Step: identify and select events in the Southeast Region of the country with values and characteristics similar to the TECSESP event.
- 2nd Step: contact the organizing committee of the events that most closely resemble the values and characteristics present in the TECSESP event.
- 3rd Step: interview the organizing committee of these events and understand the similarities and differences in relation to the TECSESP event.
- 4th Step: discuss the results of the research with support from the responses of the subjects interviewed, relating them to what has already been researched in the academic literature on this topic.

The 1st Stage consisted of research on search engines using the following keywords: tournament; educational; sports; cultural and solidarity. Tournaments located in the southeast region of the country were chosen. In the 2nd Stage of the research, contact was made with the organizing committee of the events that most closely resembled the characteristics and values in accordance with the principles of TECSESP, and an organizer was selected to be interviewed. Continuing the research, a semi-structured interview was conducted with the organizers of the events, supported by the directed script. The choice of the semi-structured interview technique is reflected in the fact that the organizers of the chosen events were asked pertinent questions to be observed about the objectives and values of these tournaments (presented in Tables 01 and 02 in the results section). That said, for Ludke and André (1986), the interview has a character of interaction between the interviewer and the interviewee, with an environment of reciprocity.

Finally, in the 4th Stage of the research, a conversation was held with specific literature in the area of sports management, with the speeches of the interviewees and with support from the material prepared by the organizers in relation to the events researched. To conduct the

research, free and informed consent forms were given to the participants, all of which were signed and delivered, providing conditions for the data to be collected and presented in this research, following the precepts of research ethics, following the standards of Resolution No. 466/12 and Resolution No. 510/16.

Results and Disscusions

When contextualizing the study theme, it is important to conceptualize some issues regarding sports competitions and how they are inserted in relation to values and characteristics that want to be transmitted as a message and ideals, as well as differences around these sports competitions.

To this end, it is worth highlighting that sports as a practice are classified in the following manner according to the objectives proposed by Law No. 9,615, of March 24, 1998.

Conceptualization and Purposes of Sports:

Art. 3º Sports as a predominantly physical and intellectual activity can be recognized in any of the following manifestations:

I - Educational sports, practiced in education systems and in unsystematic forms of education, avoiding selectivity and hyper competitiveness of its practitioners, with the purpose of achieving the integral development of the individual and their training for the exercise of citizenship and the practice of leisure.

II - Voluntary participation sports, including sports modalities practiced with the purpose of contributing to the integration of practitioners into the fullness of social life, promoting health and education and preserving the environment.

III - Performance sports, practiced according to the general standards of this Law and national and international rules of sports practice, with the purpose of obtaining results and integrating people and communities in the country and these with those of other nations.

IV - Training sports, characterized by the promotion and initial acquisition of sports knowledge that guarantees technical competence in sports intervention, with the objective of promoting the qualitative and quantitative improvement of sports practice in recreational, competitive or high-level competition terms. (Brazil, 1998).

Thus, the sports purposes defined by law are present in our society in various formal and informal educational spaces, such as educational sports in formal school education with physical education classes; within the informal educational space with various sports schools that may or may not have a bias towards high-performance competitions; and finally in spaces focused on participation sports that aim to provide leisure opportunities in clubs; sports arenas and other spaces where practices will be carried out according to the interests of the participants.

Around the conceptualizations of the purposes of sports, there are sports competitions inserted in this context as well, with the most portrayed and most well-known model due to the dissemination of information through the media being high-performance sports, with the main

objective of these competitions being victory in the end, requiring team effort when the sport is collective and a single effort often when this sport is individual.

There are also other types of sports competitions that are present in the daily lives of those who attend formal and informal sports venues, which are sports competitions with educational objectives. According to the authors they believe that sports and educational competitions must be balanced, so that all participants have effective conditions to succeed (Reverdito et al., 2008)

Corroborating this characteristic, according to Reverdito et al. (2008), the reason for holding sports and educational competitions is to offer all those involved challenging experiences that can contribute to the affirmation of their skills. The reference point is the student himself, playing with someone else and with himself, as a milestone for his self-evaluation.

In this way, when comparing high-performance sports competitions and educational sports competitions, they demonstrate different characteristics and objectives and, therefore, also have dissimilar expectations from those who will experience the process.

About Sporting Events

Since the work aims to understand the organization of sports event management, it is necessary to delve deeper into the literature on how these events are organized and carried out. However, when researching the topic in the literature, there is still a lack of productions around the specific area of organizing sports events, making it necessary to resort to concepts of event organization in general that will support and provide support for the understanding of how such events of a sporting, educational, cultural and solidarity nature are carried out.

The supporting work for the foundation of the concepts of Event Organization is “Event Organization: Procedures and Techniques” by the author Marlene Matias. According to Matias (2010), the Events area is a dynamic and broad space, the nomenclatures of the area are constantly updated, but it is possible to conceptualize the word Event as, being the sum of actions previously planned with the objective of achieving results established for the target audience.

By seeking to conceptualize and classify items that are part of the structure of an event, Matias (2010) defines some stages, which are: In relation to the public; In relation to the area of interest and In relation to the number of participants. In the stage in relation to the public, the space where the events take place is designated, whether they are in open spaces or closed spaces.

Open spaces are those in which they are intended for the public through adherence to a registration method, which may or may not be free, and the event may also be open to the general public. Closed events are those in which they take place in a pre-established location with a defined target audience who are invited or summoned, and attendance is mandatory. In the stage in relation to the area of interest, the types of events that exist, of which there are several, but we will stick to the classifications of the object of the study that we are investigating, which are educational; sports; cultural and solidarity sports events.

According to Matias (2010), a sports event can be one that has a link with the practice of sports, regardless of the modality. Regarding Cultural Matias (2010), he says that for an event to be cultural, it must highlight the aspects of a certain culture for the knowledge of those involved in a general or promotional way.

Finally, regarding the number of participants in an event, it involves classification according to the number of participants who will be present at the event. According to Matias (2010), there are the following events: Small-scale with up to 150 participants; Medium scale with up to 500 participants; Large-scale with over 500 participants and Mega-event with an audience of over 5 thousand participants and having characteristics of a social production that often involves political and economic factors linked to the events such as the Olympic Games or World Fairs.

Within the elaboration and execution of an event, there are several phases of the planning process, according to Matias (2010), these phases are Conception; Pre-event; Trans-event and post-event.

Within these stages, each one has its own characteristic and importance. Conception, according to Matias (2010), is the stage responsible for the idea of what the event will be, where data collection of pertinent information occurs so that the event can be executed, in addition to the objective that is desired with the event.

In the Pre-event stage, according to Matias (2010), it is the moment after the entire conception of the planned event has already been planned and when the phase of seeking to develop a plan for various sectors to be carried out begins, such as: executive coordination; financial controls; administrative services and the social part of the event, seeking to develop plans for the services to be provided at the event.

Moving on to the Trans-event stage, which refers to the execution during the event, Matias (2010) says that it is the stage where the activities to be carried out during the event take place; these steps that were previously planned are monitored by the organization through a

checklist based on the completion of the tasks as a way of being able to evaluate and monitor the event for possible necessary corrections. Finally, the post-event stage, which is the moment when the organizing team meets to discuss the processes carried out at the event. According to Matias (2010), this stage consists of technical, administrative and participant evaluations, evaluating the results previously expected with the results obtained from the event, seeing if the attitudes were correct and whether possible adjustments should be made for future events.

In general, classifications, procedures and event techniques are vital for a good conception, preparation, execution and monitoring of future events and are terms and techniques that can possibly be adapted to the context of sports event management, being a great support material for the feasibility of events with this characteristic.

Therefore, to continue the study, we will address how TECSESP, an event of an Educational, Sports, Cultural and Solidarity nature, seeks to hold this competition around the values that the organization of the TECSESP event seeks to achieve with this proposal.

Event Description

There is much debate about the concept of events, such as their typology and intentionality. That said, goals and objectives are set by the organizers, and according to Senac (2000), events are characterized by the following aspects: size, date of the event, profile of participants and the objectives they intend to achieve.

TECSESP, the Educational, Sports, Cultural and Solidarity Tournament, an event conceived by one professor of the Curt Walter Otto Baumgart Etec of Sports Technical School, in 2013, came up with the idea of providing an event that would have a beneficial and subtle interaction between the people who are part of TECSESP, especially students from other state technical schools related to Paula Souza Center. One of the proposals is to improve the socialization aspect among participants, athletes and visitors, to raise citizenship among those involved and also to help in the better training of the people who are participating, and above all, to consider the cooperative aspect before the competitive aspect. The competition is organized and promoted by students of the technical course in Sports Organization at Etec. Being a great opportunity for students of the course, the organization of TECSESP is the moment for future technical graduates in Sports Organization to explore and put into practice the theoretical knowledge and experiences obtained during the course.

In the last edition of TECSESP, held in 2022, TECSESP brought together more than 12 thousand registered participants, belonging to 52 Etec´s. The event is conceived at least three months before the initial start, where an organizing committee is formed with teachers and

students who make up the “model office” group belonging to Etec of Sports.

In the group, proposals and solutions for the new editions of the event are discussed, in addition to meetings with the school community of the other participating Etec´s for a Technical Congress around the rules of the modalities and the competition model. Subsequently, meetings are held between the event's organizing committee and the representatives of the participating Etec´s, where they are instructed on how the event will be developed, from the delivery of documentation, objectives and general guidelines of the event, as well as the regulations.

In general, the TECSESP event can be divided, as previously seen in the literature, into three stages of event organization, namely: pre-event; trans-event and post-event.

The Pre-event is the stage in which guiding questions about the event are discussed, starting with what the objective is or what the event seeks to achieve. Once the objective is defined, the theme is developed, the target audience is identified, the location where the activities will take place is chosen, the dates are defined, and also the work schedule is defined. Above all, training is provided for the reception of guests and the officials of the sports activities.

Then, in the Trans-event, when the activities planned for the pre-event are implemented, the students organizing the event, together with the organizing committee and the model office, hold an initial meeting before the official opening, to align the final details and direct the students to their respective work groups, so that they can then begin their professional activities.

Finally, in the post-event, a general meeting is held between the organizing committee, where the feedback is put into practice, that is, the organizing participants of TECSESP present their ideas and impressions, in addition to the mistakes and successes that occurred during the main event. Therefore, in the subsequent edition, new implementations of improvements can and should occur, providing better use and ambiguous entertainment, both for those who are organizing the event and for those who are participating.

So, this event, it aims to meet the educational aspect that According to Paes (1996), the first contact that children have with sports occurs in educational environments, where motor skills and abilities are developed, including in collective and individual sports, creating a primary motor repertoire, which will develop as the individual matures. It is worth noting that affective, cognitive and social aspects interfere in the development of the individual. Furthermore, from a very early age, play in the child's life is of fundamental importance, because when they play, they explore and handle everything that is around them, through physical and mental efforts (Araújo, 1992). In addition to this aspect, it contemplates the sports

aspect. This means that, although TECSESP encompasses collective sports, such as soccer and volleyball, they are undoubtedly not organized to be played at a high level by the participants, but rather as a competitive physical activity. Furthermore, if a runner challenges another runner to a race, this race becomes a form of competition or contest. It is competitive, but it develops in a more or less informal manner. Only when the two runners follow the formalized rules and compete under standardized conditions can we say that they are practicing sport (Barbanti, 2006).

Still on the process of characterizing sporting events, a better understanding of the term "Culture" is necessary. So, when we refer to culture - a term widely used in anthropological areas of academic and social studies, culture here relates to sport in the way that it is called body culture of movement. That said, we realize that the body is capable of expressing gestures and sounds, for example, and according to Koffes (1985), the body is the expression of culture, therefore, each culture will express itself through different bodies.

Finally, the solidarity aspect. As can be seen in De Melo (2005), when he mentions the Four Competencies for the Development of Potentials idealized by UNESCO, in these four competencies it is possible to observe that the following are present: learning to be; learning to live together; learning to do; learning to know. However, this issue can be resolved in the next editions of TECSESP due to the change in the competition model, making teams advance to new phases of the competition as they win the disputes and continue this process of coexistence with the other participating teams, thus making it possible to create friendships and experience the spirit of solidarity through the games, both internally and externally.

Based on the premise of the values that TECSESP understands in its tournaments as: Educational; Sports; Cultural; and Charity Tournament, we consulted through the events that had available regulations to determine which characteristics the events studied fit.

The research also observed the possible sporting purposes of the events held, that is, whether these competitions were for participatory or educational sports. Then, we tried to observe the type of competition in which these events were held, sometimes a tournament or circuit, sometimes a festival.

In the same way, the number of participants can also be verified, as the events that bring together a greater number of participants are those that have a variable frequency, in other words, those celebrations that happen all the time, but not on a fixed date. Based on this, Table 1 was prepared.

Table 1.

Educational, Sports, Cultural and Solidarity Events in the southeast region of Brazil

Event	number of participants	type of competition	frequency	local
1 Copa of futsal of São Paulo City	>400	tournament	itinerant	São Paulo-SP
Interceus-Sp	>500	tournament	itinerant	São Paulo-SP
Olimpiadas Estudantis-SP	>500	tournament	itinerant	São Paulo-SP
Festival jogos estudantis-SESISP	400	festival	itinerant	São Paulo-SP
Torneio esportivo Paraisopolis	60	tournament	fixed	Parisopolis-SP
Festival de Verão de Bragança	<50	festival	itinerant	Bragença Paulista-SP
Esporte Solidário Itaguara	<50	tournament	itinerant	Itaguara-MG
Campeonato e orrevoada de pipas	>50	tournament	sporadic	São Paulo-SP
Torneio esportivo Solidário Itupeva	>50	tournament	sporadic	Itupeva-SP
Torneio Handebol Solidário Cabreúva	50	festival	sporadic	Cabreuva-SP
Xadrez Solidario	60	tournament	sporadic	Araraquara-SP
Festival de voleibol misto SESCSP	300	festival	itinerant	São Paulo-SP
Circuito pé na areia Caraguatatuba	1200	circuit	itinerant	Caraguatatuba-SP
Cirtuito esportivo do litoral norte	1000	circuit	itinerant	São Sebastião-SP
Festival de volei para idosos-SESC	50	festival	itinerant	São Paulo-SP
Festival ginastica para todos-SESC	100	festival	itinerant	São Paulo-SP
Futebol society bola na rede comida na mesa	70	festival	sporadic	São Paulo-SP
Copa volei feminino SESCSP	80	tournament	itinerant	São Paulo-SP
Festival de Futsal SESCSP	70	festival	itinerant	São Paulo-SP
Circuito pé na areia Bertioga	300	circuit	itinerant	Bertioga-SP
Campeonato municipal de futebol	150	tournament	itinerant	Santana de Parnaíba-SP

After composing the Table prepared by the authors, it can be observed that these events were separated according to some characteristics, such as: number of participants; types of competitions; frequency and location of these.

In relation to the number of participants, 11 of the events surveyed had less than 100 participants; 7 of them had 100 or more participants and 2 of the events had 1000 or more participants, with only one of the events for which no information was found regarding the number of participants.

Regarding the types of competition of the events, the following were: 10 events in tournament format; 8 in festival format and 3 in circuit format. Regarding the frequency of these events, the following were: 15 events with variable frequency; 3 events with sporadic frequency and 1 event with fixed frequency. Based on this information, we sought to contact the organizing committees of the events in order to interview the people responsible for organizing the events. However, we did not receive any feedback or contact with them, and we were only able to discuss this work based on the findings available on the websites and news about these events.

From this, an interview was conducted with a member of the TECSESP organizing committee, in which this work sought to answer some concerns about the organizations of these sporting events regarding the procedures for designing and holding events that seek to bring

ideals different from the practices of high-performance sports.

The questions to be answered addressed the following topics: event objectives; organizational models of events; intrinsic values in relation to the events; what the participants' interests in relation to the events are; what is the participants' view of the event and the opinion of the TECSESP Organizing Committee (COT) regarding the relevance of the study presented here. For the purposes of maintaining anonymity, the member of the TECSESP organizing committee will be referred to as COT.

Regarding the event's objectives, COT says:

"In order to achieve this, when developing a sport, cultural and solidarity tournament, we have to think first about the social and cooperative aspects before thinking about the competitive aspects. So, the objectives we are aiming for are interaction between people, improving the socialization aspect, among participants, athletes and visitors, improving citizenship among those involved and also helping to improve the education of the people who are participating".

According to the organizing member of TECSESP, the event was structured with the objective of promoting interaction between people, improving the socialization aspect among participants, athletes and visitors, improving citizenship among those involved and also helping to improve the education of the people who are participating.

Therefore, with the objective of demonstrating the value of solidarity as cited by De Melo (2005), regarding the Four Competencies for the Development of Potentials idealized by UNESCO, it is possible to observe that these four competencies are present: learning to be; learning to live together; learning to do; learning to know.

According to the organization of this event, the professor believes that TECSESP participants are interested in cooperating in the editions, with the objective of socializing as a whole and "There is also a form of leisure among direct and indirect participants who are those who do not play, but are here at the event to be able to participate in the activities that take place or just cheer, meet people and interact with the rest of the public". Not only that, but this affective and optimistic exchange is present in the culture, one of the values proposed by TECSESP and according to the Ministry of Education, 2001, one of the central objectives of Culture is to "Use different forms of language to communicate and express oneself".

Also, according to the structuring of the stages of conception: pre-event; trans-event and post-event, the interviewee and the importance of using organizational models of events for this, COT responds that:

''To hold any event, I believe that a guideline needs to be followed, and throughout these 10 years, what I used at TECSESP was both theoretical knowledge, which is very important, and practical knowledge. The theoretical knowledge involves the three stages of the event - Pre, Trans and Post, in which, before thinking about the Pre, we must think about the feasibility of this event, what goal we want to achieve with it. After this part of planning, of structuring the event, and if approved, as it was, we go to the Pre part. So, I believe that, within these three stages, we must think about two beforehand, such as the conception and feasibility of this event. After these two stages, we must think about the Pre-event. In the Pre-event, this is where we are structuring everything that was thought of and following the manual or organizational models, which will make us think about and minimize the negative impacts that the event may have at a given moment. During the Trans-event, this is the execution part, and the execution does not start, it is not restricted only on the day of the event, but from the moment we finish the Pre-event part, the Trans-event begins one month or 15 days before the event. And the post-event begins from the moment the event began, because the post-event is not only about the feedback, but also about everything that will occur during that stage, where the event first "started" and its operational organization.

In the interviewee's speech, it is possible to see that he is supported by what the literature on the events area conceives for the idealization of events in all the necessary stages, as shown by Matias (2010), with the Events area having the sum of previously planned actions with the objective of achieving established results for the target audience. Regarding the values that the event wants to convey as a message, the interviewee mentions that:

''When we thought about TECSESP as an educational, cultural and solidarity tournament, the first values we thought about were the training of students, the social interaction between people, the appreciation of sports, culture and also the social aspect, and showing that sports are also a place for social interaction where people can have their leisure time and also harmony among people".

The interviewee's statement is very clear and corroborates what Matias (2010) says about the dynamism of the conception of events, linking each one's definition to its own. However, what stands out in COT's statement is that there is a mission to hold the event that includes everyone involved and, therefore, the issue of values is to include this diversity of people involved who are working to organize the event and those who are there to celebrate the event by participating, demonstrating the diversity of TECSESP, as is evident in Table 2, that among the events researched in this study, only this one includes the various values.

Table 2.

Classification of Events regarding: Educational, Sports, Cultural and Solidarity in the southeast region of Brazil

Event	educational	sporty	cultural	solidarity
1 Copa of futsal of São Paulo City		X	X	
Interceus-Sp	X	X	X	
Olimpiadas Estudantis-SP	X	X	X	
Festival jogos estudantis-SESISP	X	X	X	
Torneio esportivo Paraisopolis		X	X	
Festival de Verão de Bragança		X	X	
Esporte Solidário Itaguara		X	X	
Campeonato e orrevoada de pipas		X	X	
Torneio esportivo Solidário Itupeva		X	X	X
Torneio Handebol Solidário Cabreúva		X		X
Xadrez Solidario		X		X
Festival de voleibol misto SESCSP		X	X	
Circuito pé na areia Caraguatatuba		X	X	
Cirtuito esportivo do litoral norte		X	X	
Festival de volei para idosos-SESC		X	X	
Festival ginastica para todos-SESC		X	X	
Futebol society bola na rede comida na mesa		X		X
Copa volei feminino SESCSP		X	X	
Festival de Futsal SESCSP		X	X	
Circuito pé na areia Bertioga		X	X	
Campeonato municipal de futebol	X	X	X	

In relation to Table 2 prepared by the authors, it can be observed that the sports events organized in the southeast region, in their great majority, have characteristics that are like TECSESP insofar as they are all inserted in the Sports context.

However, the School Value of the events researched was not so widespread, perhaps explained by the fact that majority of the events occur outside the school environment and because the school events are held and organized by agencies linked to education in which there is a strong dissemination within the school community, but there is not much information externally.

Another characteristic of these events is that in the majority of them, many have a cultural value permeating them through the research carried out, however, as seen previously, it is worth noting that the concept of Cultural is very broad and according to Matias (2010), says that for an event to be cultural, it must highlight the aspects of a certain culture for the knowledge of those involved in a general or promotional way.

Another factor when observing Table 01 is that the value of solidarity is usually implicit in the very name of the events researched and that the other events do not encompass the sphere of solidarity value, in addition to the fact that these events also have fewer participants

compared to the other events.

However, thinking about this, it is important to understand how these values are worked on within the event and what characteristics they are present. According to the interviewee, the cultural value is portrayed as:

"When thinking about an event, at a school, and a sports event, I thought about the conception of this event, to include cultural modalities, for a simple reason, which would be to bring more people and make those people who do not practice, who are not used to practicing conventional sports, be present at the location. So, it is to give the opportunity to children, adults, students, athletes, to show the other skills they have, not only in the game part. So, the dance was, the dance and the singing, it was with the idea of showing talents and not discovering talents, but rather showing that such a person has and, successfully, we brought the cheerleaders there, we noticed that, over the time that TECSESP was happening, the dance was already consolidated there, many other people did not participate in the cultural part, and the cheerleaders, it was something that I saw in North American schools and in movies and such, and I brought this modality to TECSESP to make it include even more people within the Etec's, so that people could have a chance to act and also be protagonists of the school by performing here at the event".

Regarding the value of solidarity, the interviewee says that:

"So, with the, when talking about the solidarity part, the sporting-cultural event, it comes a lot from this basis of the smaller social events, which is helping others. So, at certain times, when organizing an event in a certain community or in a needy region, charging for admission or participation makes it harder for people to participate. So, we found this social aspect, a way to get people to participate directly and to be able to contribute with their participation, and to know that that person has helped or will be helping someone by donating food or clothing. So, the idea when we proposed this solidarity aspect is to make the art of donating something that they do willingly and that this can happen at various stages of their lives, not just at this event".

In the speech of the member of the COT, it is clear that the event was concerned with portraying these values in a way that relates to the cheerleading modalities, which are part of American school culture, but which manages to enable the participation of students who would not previously have been included in other more competitive modalities. In addition, there is a solidarity factor linked to the cultural factor when considering that the cheerleading practice itself is mixed during the presentations, requiring the involvement of boys and girls to perform

the choreographies in the best way.

In relation to the solidarity value, the organizing committee of the event is concerned with seeking to highlight the participants' collaborative practices within sports, but also in the act of donating as a gesture that is remarkable there in the youth, but that this represents something beyond being an act carried into the lives of the students participating in the event. An important factor in event design is understanding what the target audience wants in relation to the event, in the case of TECSESP, what makes participants attend the event and come to it, according to the COT:

"In the opinion of the organizing committee, I can say that over the last 10 years, people have become interested in sports and cultural events, with the aim of interacting with other people. When it comes to a sports and cultural event of a cooperative nature, and not so competitive, people want something more that the event can provide, which is the so-called viability and socialization in different aspects, and of course, even the main objective of the event is the practice of sports and the presentation of cultural modalities, which is not restricted to just dancing and singing, but to all its interventions. And the objective that people have and I could observe within the school environment was that there is interaction and also a form of leisure among the direct and indirect participants, who are those who do not play but are here at the event to be able to participate in the activities that take place or just cheer, meet people and interact with the rest of the public".

Another important factor is the perception of the participants regarding the competition within the event, whether TECSESP is a traditional sports tournament or a tournament different from the traditional ones, and according to the interviewee:

"So, in fact, in my opinion, I believe that they see TECSESP as something that they have to win, not a high-performance event, because it is easy to say that the rules are not the same as other events, so it can no longer be a high-performance event or tournament. And yes, they want to win, they want to be among the best, because they do not have this within the school and there, they have greater recognition among the participants and the protagonism among the Etec´s. So, I understand that participants do not see the event as high performance, but rather as a more competitive than cooperative event, and the competition is within what the event can provide for them".

During the years of the event, according to the interviewee, although participants come to compete and seek to win the competitions, they are still excited about being in a different environment and being able to meet new people and socialize through the sports environment.

In general, the feeling of belonging to the group of young participants involved in the TECSESP environment permeates what is said in Da Silva (2022), in a country with alarming rates of social inequality, the belonging of citizens to a certain area or place determines their potential in the face of the hegemonic class.

Finally, in the view of the event's organizing committee, what is the vision around a study like this that seeks to understand the organization of sports events with characteristics different from those already advocated by traditional sports event models? COT says that:

"I believe it is a redefinition of the proposal that the events are bringing there for some actions. And with this study, it can even serve as a basis for some event organizers who already develop their events and do not have any of these actions conditioned in their operation, so that people can review some points and start working in a possible way, always with the help of trained sports organizers, who have knowledge for certain actions".

Therefore, the study of the area of sports events still needs to be explored and further disseminated so that events that seek to differentiate themselves from the logic of high-performance sports can have other parameters to support diverse events that seek to explore through values and actions how the Educational, Sports, Cultural and Solidarity tournament seeks and has been carrying out throughout the editions with the involvement and belonging of the participants.

Final Considerations

This study was motivated by the exploration of the area of sports events, of those events that seek to differentiate themselves from the formal logic of high-performance sports events and, through this bias, sought to find events that have such different characteristics around mission and values. For this, it found inspiration in the Educational, Sports, Cultural, and Charity Tournament under the light of sports management, to glimpse something different in the way of holding events.

Based on the articulation of the literature in the area of events; with the support of the Educational, Sports, Cultural, and Charity Events Board in the Southeast region and together with the interview with the organizing committee of TECSESP, it was possible to glimpse that there is a concern in holding sports events that are not merely tied to the dogmas of competition, where the winner is rewarded, recognized as the best, and the loser recognized as the loser.

It is evident that there is a concern about the values expressed in the name of the Educational, Sports, Cultural, and Charity Tournament. and Solidarity not only in being a name but in giving meaning to these values through actions, whether by the participants being

protagonists exercising these values during the playing of the sports modalities but also in external actions outside the courts symbolized by the fans who celebrate with the other participants from other spaces as well as those involved in organizing the event, symbolizing cooperation in other sectors, highlighting the spirit of solidarity in this environment.

In other words, in general, the vision of the TECSESP Organizing Committee in relation to the participants of the event is experienced in the day-to-day succession of the competitions in a way that socialization occurs with different people who meet for the educational, sports, cultural and solidarity celebration.

However, it is necessary to say that there is a need to identify the speech of the other organizing committees mentioned in the work as well as the vision of the participants of the events, observing if there is a relationship between what the organizing committee sees from their perspective with the event and what the target audience of the event sees. Guiding new studies on this topic, the study of the target audience of these events, recognizing their opinions and whether these are in fact understood in the elaboration of events with these characteristics that seek to differentiate themselves from traditional sporting events.

For all these reasons, it is considered that the area of sporting events, as well as the organization of sports, must continue to be studied in order to expand the field of knowledge, enabling new studies and new practices to be known by society and for them to benefit from and experience this environment of belonging that such spaces can provide for those involved in the process.

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Covid-19 And Its Impacts On Students' Attitudes And Behaviours Related To Proper Nutrition, Alcohol Consumption, And Smoking.

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Abstract

Albania has experienced tremendous political, social, and economic transformation throughout the 1990s. Among these have been modifications to nutrition, both in terms of quantity and quality. Most people now live in better conditions thanks to the move in the political system towards a free-market economy, which also resulted in more cars on the road. As a result, there was a surge in both environmental pollution and population inactivity, which has been connected to obesity and overweight in all age categories. For children and young people, unhealthy eating habits and physical inactivity have the biggest effects. This study, which involves students from the Faculty of Physical Activity and Recreation practically every year, aimed to determine the prevalence of overweight and obesity, as well as alcohol and cigarette use, in first-year bachelor's students. The study's main goal was to determine whether the Corona virus epidemic had any influence on the results. 140 students were chosen at random between October and November 2021, with a mean age of 18.69 years (58.75% male and 41.42% female participants). The results indicate that some sports university students may benefit from studying a sports nutrition module as well as nutritional and health promotion programs to lessen this propensity, especially in male students, even though the general prevalence of overweight and obesity in the sample investigated is low. We believe that the rise in alcohol and cigarette use since the end of our previous study in 2019 is likely due to isolation during COVID-19, either out of boredom or to deal with tension and anxiety levels that have been reported to rise across the board in all demographic groups.

Keywords: Covid-19, Attitudes, Proper nutrition, Alcohol consumption, Smoking, Students.

Introduction

The first two cases of the coronavirus, a father and a son who had traveled to Albania from Florence, Italy, were officially confirmed there on March 8, 2020. The government outlawed all ships and flights from northern Italy on the same day until April 3rd, 2020 (Troka et al., 2021). The unpleasant experience of being in quarantine can have an impact on a person's health since it involves loss of freedom, uncertainty about the presence of a disease, and boredom. As a result, the potential advantages of mandatory mass quarantine must be carefully evaluated against any potential long-term health risks, such as increased cardiovascular risk and mental illness. There was a significant amount of psychological anguish and disorder among individuals in the survey who had been confined.

Over a third of the world's population is currently affected by obesity and overweight (Stevens et al., 2012), both of which are complex, multifaceted, and generally preventable diseases (Rippe et al., 2014). According to estimates from (Kelly et al. 2008), 20% of adults worldwide will be obese and 38% of them will be overweight by the year 2030 if secular trends continue. For children and young people, unhealthy eating habits and physical inactivity have the biggest effects. One of the main responsibilities of health and education professionals is the promotion of healthy behaviors, particularly those connected to nutrition and physical activity (Schlessman et al., 2011). The health advantages of eating a Mediterranean-style diet have been supported by numerous studies (Dominguez et al., 2021).

In terms of the influence of trendy lifestyles, which are typically defined by health-risk behaviors, university students are a vulnerable demographic. These practices include low consumption of fruits and vegetables, diets heavy in fat and cholesterol, and other risky eating habits (Factores Sociales En Las Conductas Alimentarias De Estudiantes Universitarios, n.d.). Universities can be used strategically to encourage healthy behavior patterns and practical strategies for encouraging students to engage in more healthy behaviors (Rodiguez et al., 2013).

Frequent family dinners may enhance children's and young people's healthy development, according to a growing body of research (Fulkerson et al., 2014; Harrison et al., 2015; Skeer & Ballard, 2013). Families can cook and share healthful foods at family meals. According to (Berge et al., 2016; Fulkerson et al., 2009; Larson et al., 2006; Utter et al., 2013), children and young people who frequently have meals with their family report better nutrition and eating behaviors, such as eating more vegetables and less fast food.

Epidemiologic studies have repeatedly shown that light to moderate alcohol consumption is linked to lower risks of cardiovascular disease and overall mortality

(Beaglehole & Jackson, 1992; Zilkens & Puddey, 2003; Corrao et al., 2004; Reynolds et al., 2003). This association may be due to the positive effects of alcohol on blood lipids, particularly high-density lipoprotein cholesterol and clotting factors (Rimm et al., 1999). However, it is frequently found that the illness risks of heavy drinkers are only somewhat higher than, if not comparable to, those of nondrinkers. Heavy alcohol use is associated with increased risks of cardiovascular disease and all-cause mortality. Although there is now a wealth of epidemiologic evidence linking alcohol to a variety of diseases (Corrao et al., 2004), practically all cohort studies that have evaluated these connections have employed baseline alcohol intake measurements in their analyses.

Lower education levels, lower incomes, and lower occupational positions have all been connected to higher obesity prevalence (Singh et al., 2010). The bulk of medical expenses worldwide are related to obesity and overweight, which are significant risk factors for deaths that could have been avoided (Kjellberg et al., 2017). One of the most important things that can be modified to encourage good aging is an adequate diet (Dominguez et al., 2022).

The emphasis of nutrition research on health outcomes has shifted in recent decades from looking at the effects of individual nutrients and foods to looking at interactions between nutrients and foods in dietary patterns, taking into account the potential synergistic and/or antagonistic actions of foods

and nutrients when consumed simultaneously in a food pattern (Jacobs & Steffen, 2003; Jacobs & Tapsell, 2013).There have been major changes in both the global production and distribution of food from the middle of the 20th century to the present (Popkin, 2006; Whitmee et al., 2015).

The advances in crop yields and food production can help explain some of the decrease in hunger and increase in life expectancy (Steffen et al., 2015). However, the growth of unhealthy westernized dietary patterns, which include a lot of processed and ultra-processed food that is particularly heavy in calories and low in important nutrients, balances out these good impacts (Drewnowski, 2017). ‘Low-nutrient-dense food' is the term now used to describe this kind of meal. The availability of low-nutrient meals worldwide and the continued acceleration of urbanization have also contributed to this trend (Vilar-Compte et al., 2021).

Chronic illness risk may be increased when poor lifestyle factors, including smoking, drinking, and inactivity, are combined with obesity. Nutritional information might thus serve as a deterrent against the trend toward fast food. Therefore, by promoting healthy eating practices, sports universities may have a substantial impact on lowering the prevalence of

obesity in the young population (Çitozi & Bozo, 2014). My colleagues and I have conducted this survey with first-year bachelor students every year since the establishment of the Faculty of Physical Activity and Recreation in 2010. Finding the averages for height, weight, BMI, eating patterns, and other behaviors among the youngest members of our staff is the goal.

The use of cigarettes and alcohol is another subject of investigation. Physical activity, food, sleep, smoking, drinking, and drug use are all actions that have a bearing on one's health (The World Health Report, 2002, Overview, 2002). Health-related behaviors include eating, drinking, using drugs, smoking, and sleeping (The World Health Report, 2002, Overview, 2002). University students have a high rate of tobacco smoking, which typically begins in youth and intensifies there, according to (Martínez-Hernáez et al., 2012).

The results of the study allow us to compare the data to what is occurring in the other two faculties at our university, as well as to what it was like before and during the pandemic, in order to give our students the most accurate information we can about their eating and behavioral patterns each academic year and provide the best recommendations for improving the current situation.

Materials and Methods

This study, which involves students from the Faculty of Physical Activity and Recreation practically every year, aimed to determine the prevalence of overweight and obesity, as well as alcohol and cigarette use, in first-year bachelor's students. The study's main goal was to determine whether the Corona virus epidemic had any influence on the results. A certified questionnaire with 11 questions has been used. The students were chosen at random, and before completing the questionnaire, they were given instructions on how to do it properly. 140 students in all took part in this study between October and November 2021, with a mean age of 18.69 years (58.75% male and 41.42% female participants).

Results

Characteristics of the students' sample and BMI values

Table 1 lists the traits of the students who participated. With a mean age of 18.69 years, a total of 140 students (82 males and 58 females) took part in this study. The participating students had average body weights of 66.07 kg and 1.71 cm, respectively. BMI on average was 22.43. Obesity is defined as having a body mass index (BMI) of 30 or higher. Grade 1 obesity is defined as having a BMI of less than 35, Grade 2 obesity is defined as having a BMI of 35 or higher but less than 40, and Grade 3 obesity is defined as having a BMI of 40 or higher (National Center for Health Statistics (US) Health et al., 2013).

Table 1.

Characteristics of the participants

Variable	Total	Males	Females
Number of Students	N = 140	N = 82	N = 58
Age (years)	18.69	18.72	18.66
Weight (kg)	66.07	72.36	59.79
Height (cm)	1.71	1.77	166
BMI	22.43	23.12	21.74

Students' weight status based on BMI categories

The majority of the students (75%) were of normal weight (71.4% male students compared to 79.5% female students). The prevalence of overweight and obesity was not prevalent among male students compared to girls (24.2% and 13.7% vs. 3.5% and 2.1%, respectively) (Table 2). In comparison, 4.7% of female pupils were underweight as compared to 0.9% of males.

Table 2.

Prevalence of obesity among students based on BMI by gender

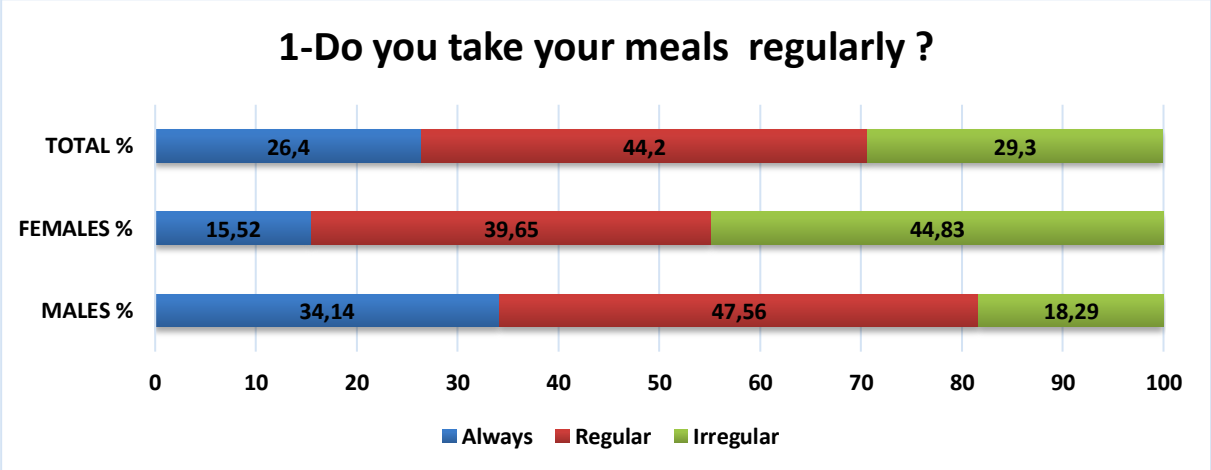
	Males		Females		Total	
Weight Status	***N=***	***Percentage***	***N=***	***Percentage***	***N=***	***Percentage***
Underweight	1	0.9	3	4.7	4	2.9
Normal	59	71.4	46	79.5	105	75.00
Overweight	20	24.2	8	13.7	28	20.00
Obese	2	3.5	1	2.1	3	2.1

Students' eating habits

The majority of students (70.6 %) who reported eating meals always or frequently did so based on their eating habits. Despite the fact that the disparity between men and women in regular meal consumption is smaller, we find a substantial difference of 18.62 % in the disadvantage of women in constant meal intake. Women consumed meals less frequently (44.83%) than men (18.29 %), which is a difference of 26.54 % in their favour. Men also tend to eat more regularly than women their age, who are more focused on maintaining their weight and physical appearance. Figure 1.

Figure 1

Question 1. Do you take your meals regularly?



Male students reported healthier daily breakfast eating habits since 31.03% of female students reported eating breakfast daily compared to 35.36% of male students, and 18.96% of female students reported eating breakfast three or four times per week compared to 30.48% of

male students. If we consider breakfast to be the most crucial meal of the day, research shows that women eat breakfast 49.99% of the time and three or four times a week, while men eat 65.84% of the time, a difference of 15.85%. (Figure 2).

Figure 2

Question 2. Do you take breakfast?

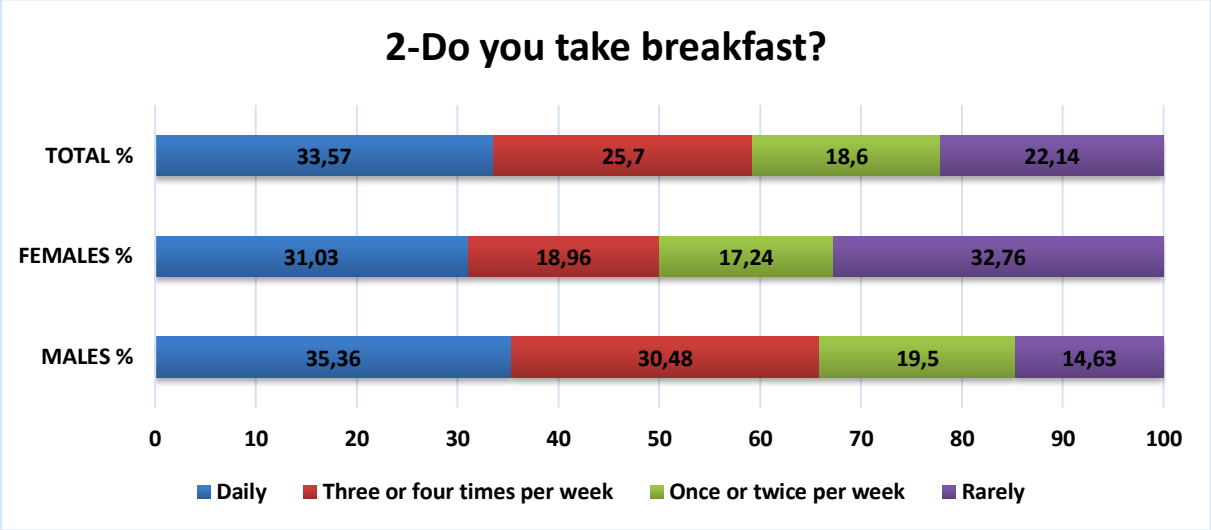


Figure 3 demonstrates that there are no appreciable differences between males and females in their daily intake of two or three meals. 77.90% of students who eat two or more meals a day consume a nutritious diet. The common lifestyle pattern is consuming three balanced meals (each around 600 calories or so), plus 1-3 snacks (of about 200 calories each) https://nutritiouslife.com. (Figure 3).

Figure 3

Question 3. How many times do you eat meals except snacks?

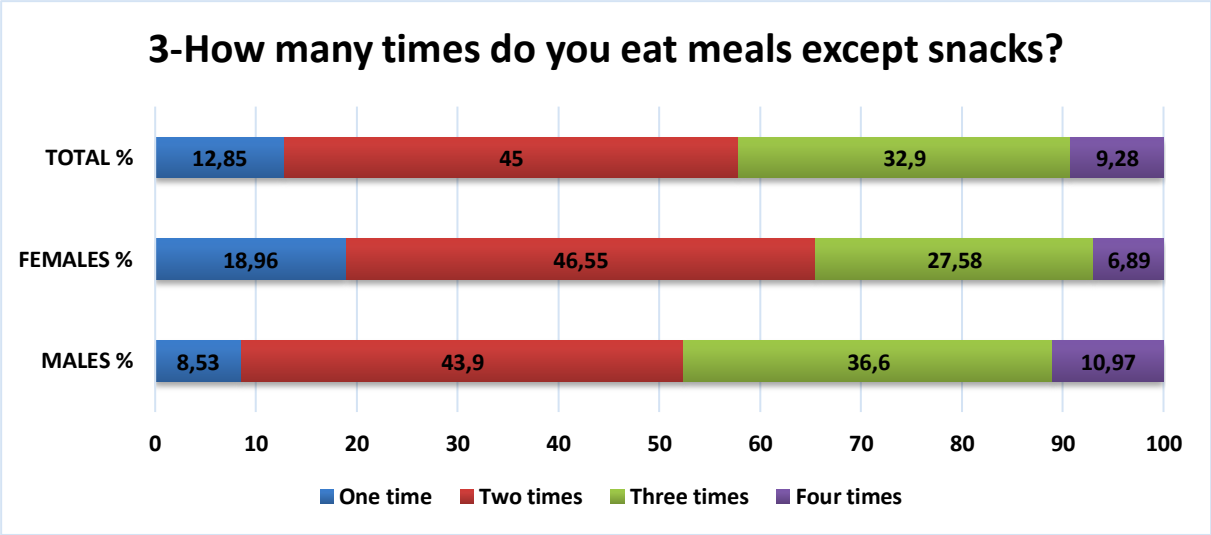
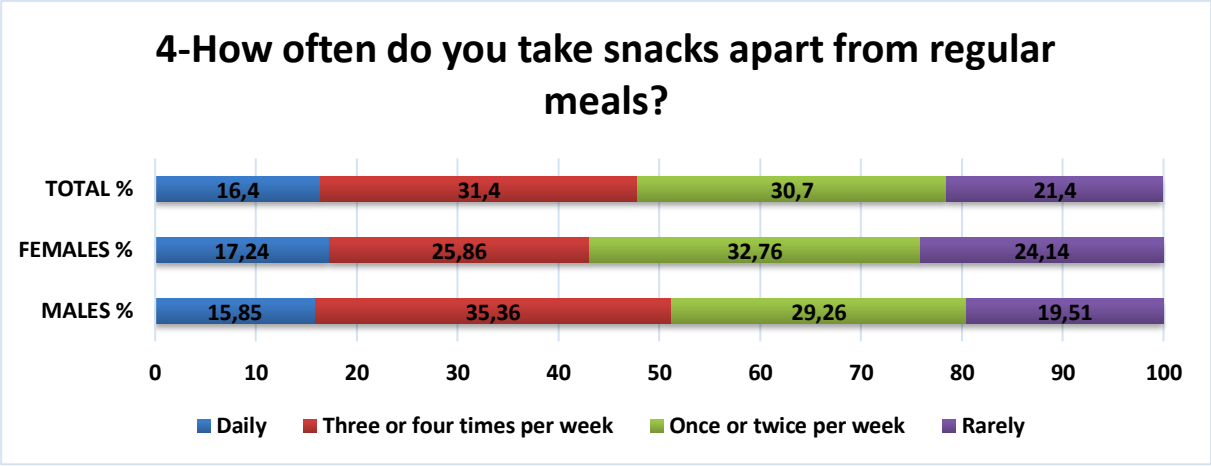


Figure 4 demonstrates that there are no appreciable differences in the intake of daily, three-times-weekly, or four-times-weekly snacks between genders. 47.80% of kids who eat snacks every day, three or four times per week, consume a healthy diet. Snacking is a popular strategy for managing hunger. One study found that eating less than three times daily is more likely to leave you hungry, so it's worth grabbing an apple or some nuts in between meals to see if that makes you feel less ravenous at the dinner table (Leidy & Campbell, 2011).

Figure 4

Question 4. How often do you take snacks apart from regular meals?

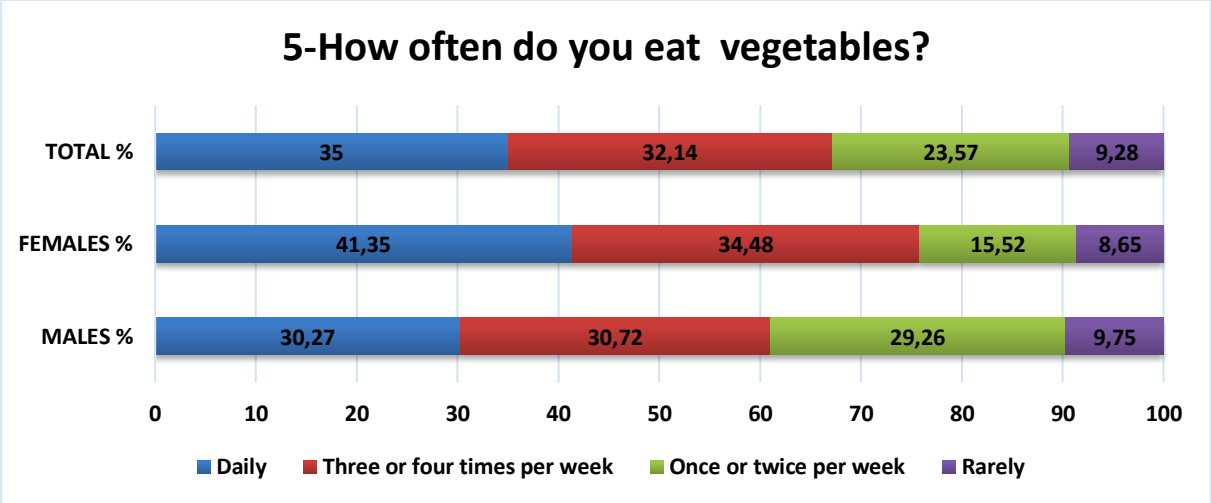


The daily intake of vegetables differed by gender by 11.08% (41.35% females vs. 30.27% males). The proportion of kids (67.14%) who consume veggies daily, three or four times per week, is within acceptable bounds. We think this has something to do with Albania, which is thought of as a prospective producer of fruits and vegetables because of its

environment. Additionally, cost reductions for the general public and students are made possible by large-scale production. Vegetables and fruits are low in calories and contain no cholesterol. They are also a great source of fibre and an incredible source of vitamins and minerals. Moreover, vegetables and fruits also prevent chronic diseases as they have the necessary vitamins, minerals, and fibre for humans (Drummond & Brefere, 2000). (Figure 5).

Figure 5

Question 5. How often do you eat vegetables?

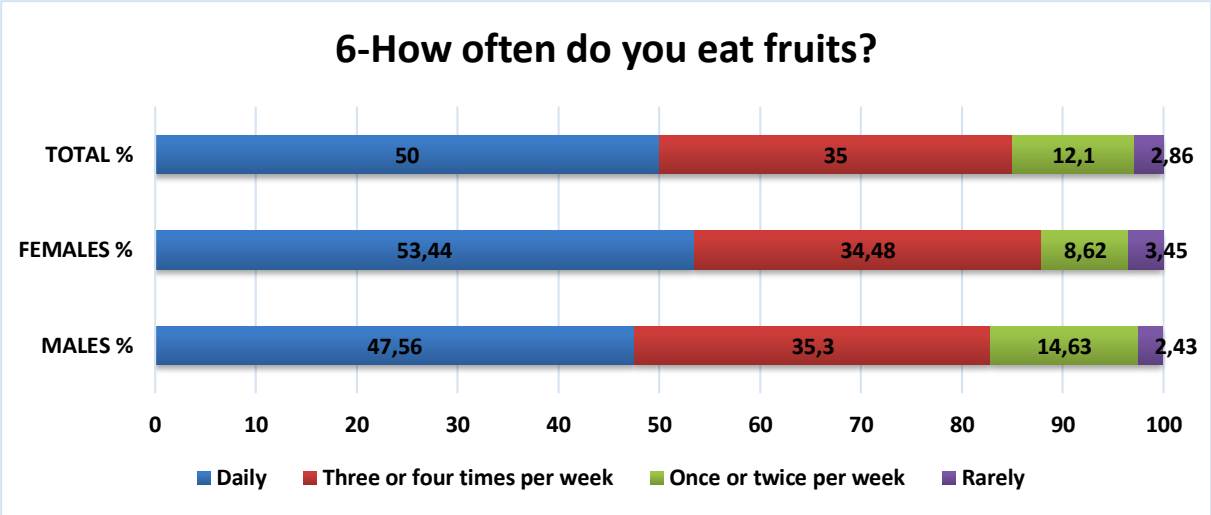


85% of kids consume fruits daily, three or four times per week, which is within recommended ranges. Fruit consumption is much greater than the average in Europe, with such a high percentage.

Apples, pears, plums, citrus fruits, watermelons, and other fruits are abundant in Albania. Consuming fruit helps pupils meet their daily requirements for fibre, as shown in Figure 6.

Figure 6

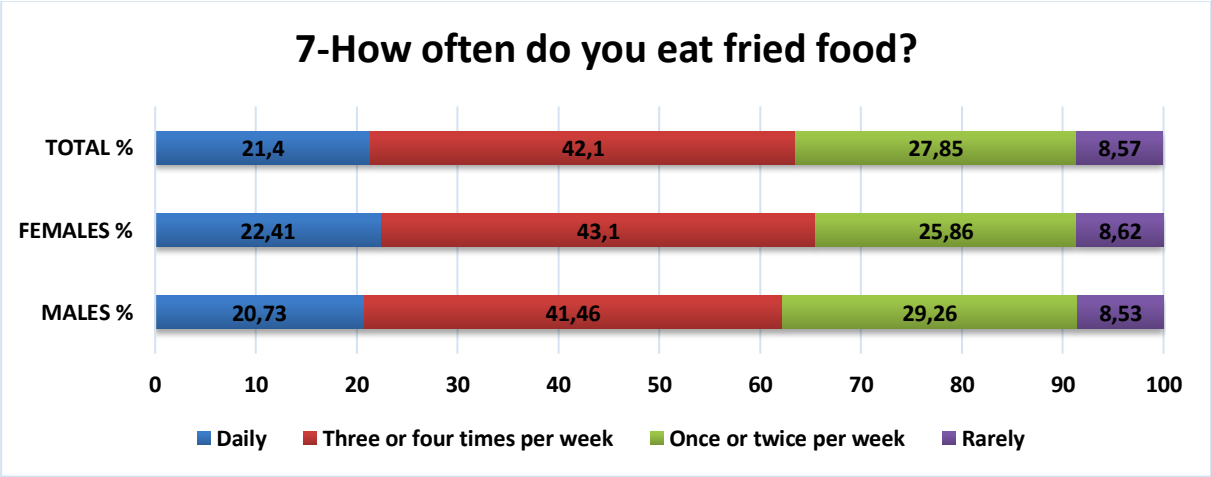
Question 6. How often do you eat fruits?



Students around the world struggle with a variety of difficulties, including excessive fast food consumption. The issue is made worse by the large number of students who live in dorms or rented apartments. The average daily consumption of fried food is considerable (63.5%, or three to four times per week), and this needs to change. Many people like the taste of fried foods. But these foods tend to be high in calories and trans fat, so eating a lot of them can negatively affect your health. (Figure 7).

Figure 7

Question 7. How often do you eat fried food?

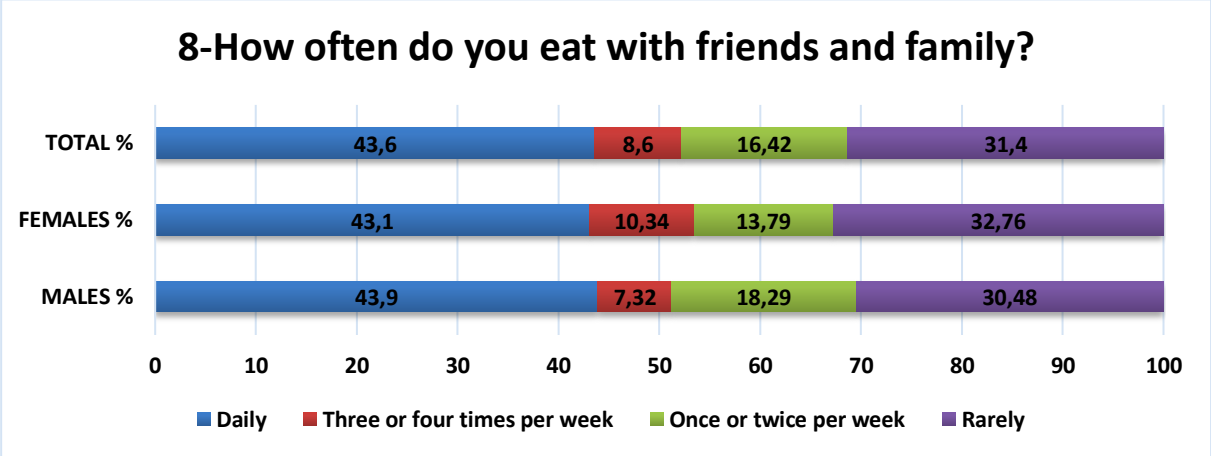


When you share a meal with others, you will not only gain personal advantages but also strengthen your community. Yes, eating with friends and family is proven to deepen ties within the community and create lasting friendships. Adults often choose healthier foods when dining

with others, according to studies. 43.6 % of students eat with friends and family, which suggests that they consume a wholesome diet. It's important to note the wholesome food our mothers prepare. Figure 8).

Figure 8

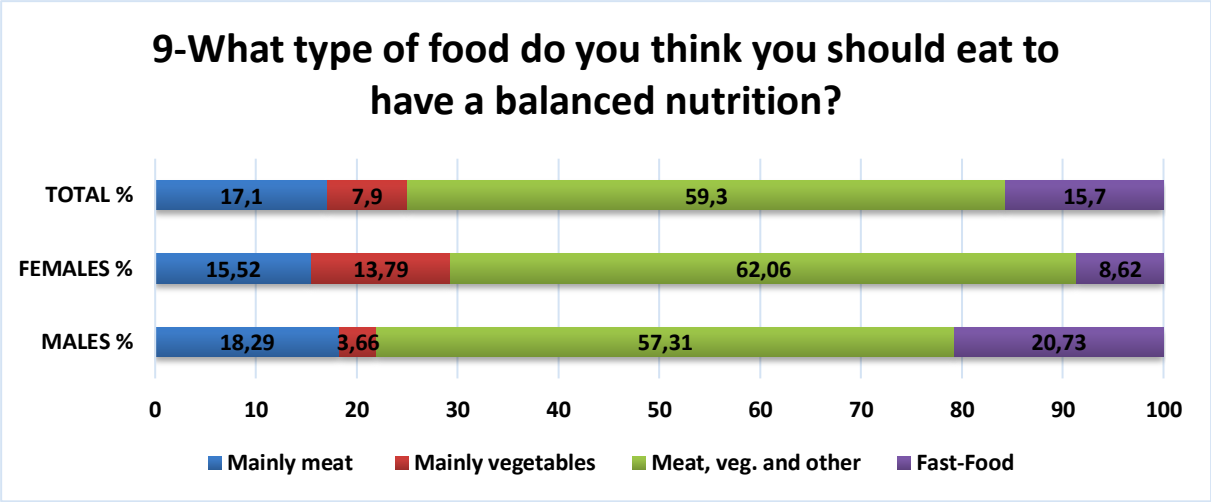
Question 8. How often do you eat with friends and family?



A balanced diet is one that includes a variety of foods in the right amounts and ratios to meet the body's needs for calories, proteins, minerals, vitamins, and other nutrients. A small portion of the diet is also set aside for extra nutrients to last through the brief period of leanness. A healthy diet should also contain bioactive phytochemicals, such as dietary fibre, antioxidants, which have beneficial effects on health. Nearly 60 % of students eat a variety of foods, which suggests that they are knowledgeable about healthy eating. Eating a well-balanced diet means eating a variety of foods from each of the 5 food groups daily, in the recommended amounts. (Figure 9).

Figure 9

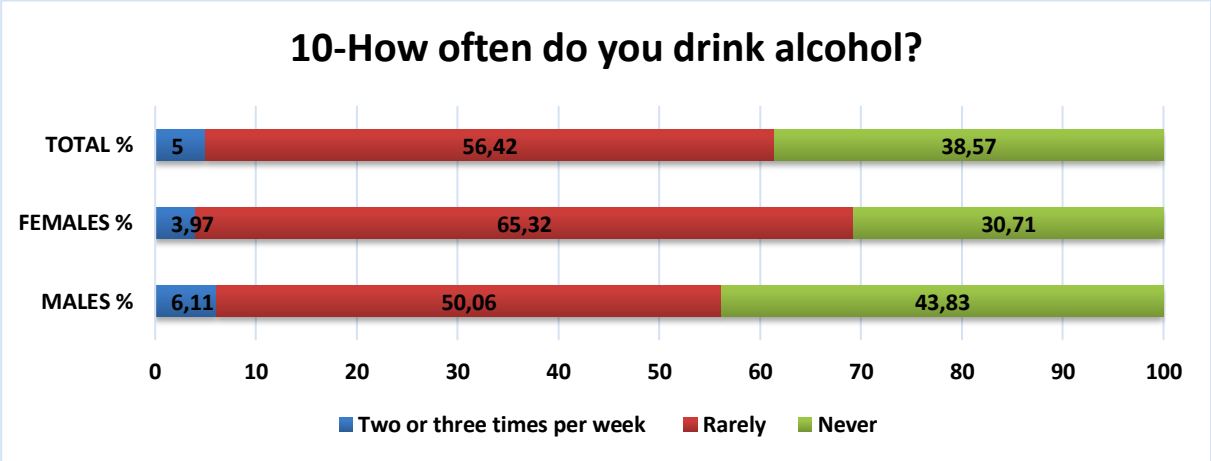
Question 9. What type of food do you think you should eat to have a balanced nutrition?



Male students (6.11 %) and female students (3.97 %) both reported drinking alcohol more frequently (2 or 3 times a week). Compared to men (50.06 %), more female students said they drank alcohol infrequently (65.32 %). A very positive sign for athletes is that over 90 % of students either never drink or only sometimes do. (Figure 10).

Figure 10

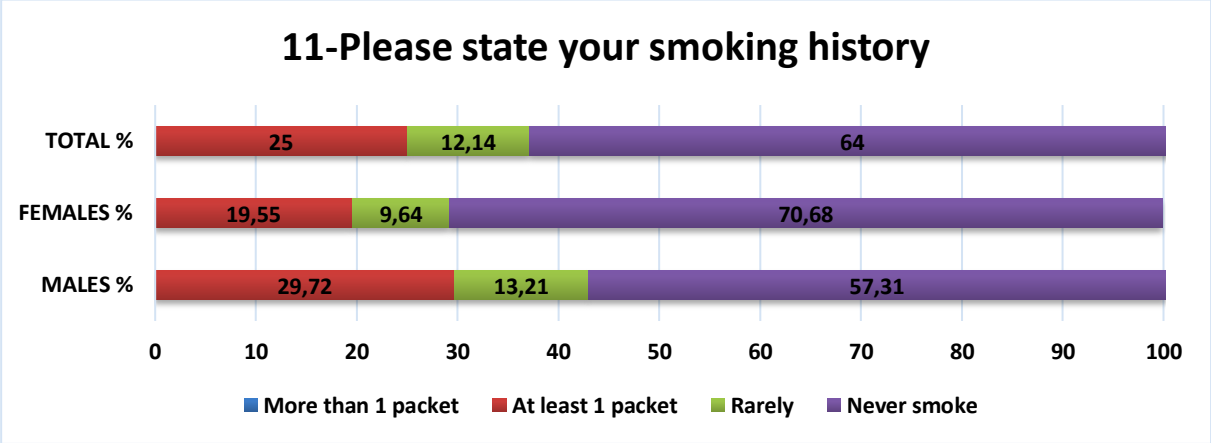
Question 10. How often do you drink alcohol?



About 64 % of our students never smoked, with 13.21 % of men and 9.64 % of women reporting occasional use. Compared to 19.55 % of female students, 29.72 % of male students smoked at least one packet of cigarettes. The objective of sports students to promote physical exercise for health is demonstrated positively by the statistic that 64 % of students never smoke. (Figure 11).

Figure 11

Question 11. Please state your smoking history.



Disscusions

The results indicate that some sports university students may benefit from studying a sports nutrition module as well as nutritional and health promotion programs to lessen this propensity, especially in male students, even though the general prevalence of overweight and obesity in the sample investigated is low. Two of the biggest factors in the burden of disease around the world are excess body weight and severe alcohol use (Organization, 2009).We believe that the rise in alcohol and cigarette use since the end of our previous study in 2019 is likely due to isolation during COVID-19, either out of boredom or to deal with tension and anxiety levels that have been reported to rise across the board in all demographic groups. As a result, during the pandemic, children and adolescents are more susceptible to gaining weight, losing immunity, and becoming infectious during the third wave of COVID-19 due to a combination of junk food, physical inactivity, and ongoing psychological stressors (S et al., 2021).

Universities can be used strategically to encourage healthy behavior patterns and practical strategies for encouraging students to engage in more healthy behaviors (Rodriguez et al., 2013).

Conclusions

The majority of Albanians students did not alter their health habits when the 2020 Corona limitations were in effect. The majority of students who made changes increased their smoking while decreasing their alcohol intake and physical exercise. In this situation, public health initiatives should concentrate on younger and lower socioeconomic-status populations, for example, by providing often online courses. Pre-university education, but especially the university, should play a crucial role in this area.

Author contributions

Professors Robert Çitozi and Ferdinand Mara created the investigation tool, processed and analysed the data, wrote the text of the manuscript, and gave their approval to the final version that was presented. The process of weight and height measurements, as well as the proper completion of the questionnaires by the students, were assisted by MSc. Klajdi Xhebexhiu and MSc. Henri Dibra.

Disclosure statement

No potential conflict of interest were reported by the authors

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Investigation of the Effects on Physiological Parameters of Football Players in Pre-season Period

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Abstract

The pre-season period in football is of great importance in order to optimise the performance of athletes and minimise the risk of injury. The aim of this study was to follow the physiological parameters of the athletes in the first pre-season preparation phase and to determine their readiness levels. Twenty-four professional licensed athletes aged between 18-35 (24.3±5.42) years participated in the study. The body weight and height of the athletes at the beginning of the season were 72.4±7.44 and 180.0±6.33, respectively. At the beginning and at the end of the first preparation phase, fat measurement, squat jump, overhead squat assessment and yo-yo endurance test were performed. The fat percentage obtained as a result of the tests was 7.43±0.73 in the pre-test and 6.99±0.65 in the post-test, 40.25±4.9 in the squat jump pre-test and 41.45±4.8 in the post-test, 17.33±3.5 in the overhead squat assessment pre-test and 19.50±2.1 in the post-test and 1723.3±307.6 in the squat jump pre-test and 1852.08±335.8 in the post-test. According to t-test data, statistically significant differences were found in fat percentage, squat jump, overhead squat evaluation and yoyo data (<.001). According to the results of the study, it can be said that the fat percentage, strength assessment, anaerobic power and endurance skills of the athletes improved in the first pre-season preparation phase.

Keywords: Football; Pre-season; Squat jump; Overhead squat; Endurance

Introduction

The pre-season preparation period in football is of great importance in order to optimise athletes' performance and minimise the risk of injury (Bangsbo 1994). In this process, the focus is on the development of basic physiological parameters such as endurance, strength, speed and flexibility. Increasing aerobic capacity enables footballers to play at high tempo throughout the match, while improving anaerobic performance is decisive in sudden accelerations, sprints and changes of direction (Bansgbo et al., 2006). While an increase in VO_2max values is observed with the training, the improvement of muscular endurance and explosive strength increases the effectiveness of the match in both offensive and defensive aspects (Impellizeier et al., 2006). At the same time, the preparation period reduces the risk of injury by supporting musculoskeletal adaptations. The endurance of muscle-tendon structures increases through flexibility, mobility and strength training. Interval training, which is frequently used in this period, delays the fatigue period by increasing the lactate threshold while improving oxygen utilisation capacity (Kelly and Dust 2009). Changes in body composition such as decreased fat and increased muscle mass are other positive outcomes of pre-season training. Furthermore, thanks to adaptations in the cardiovascular system, the heart rate decreases and athletes can perform high performance with a lower pulse rate (Rampinini et al., 2007). As a result, the pre-season preparation period enables football players to reach their peak performance by improving both physiological endurance and motor skills. The balanced development of these parameters through a systematic training programme allows athletes to make a strong start to the season and achieve sustainable success (Stolen et al., 2005).

The aim of this study was to investigate the physical and physiological performance data of a professional football club in the general preparation phase before the season.

Methods

Participants

Male football players between the ages of 18-35 (24.3±5.42) playing in a professional football club constituted the population of the study; 24 male football players with a training age of at least 5 years, participating in national and international competitions, without any disease or injury, regularly training and competing in the professional league category constituted the sample of this study. The study design and possible risks were explained to the participants and a written consent form was filled out. In order to eliminate the learning effect on the test results, a 'familiarisation session' was first performed so that the athletes could get used to the test equipment, test protocols and the investigators. For example, a brief demonstration of how to perform the overhead squat test was given and participants were asked to perform at least 2 attempts (Engquist et al., 2015). Among the procedures for data collection, all ethical research care was taken, following the ethical principles of Helsinki 2008.

Inclusion criteria:

Athletes with a regular training history of at least 5 years, training at least 5 days a week for at least 60 minutes, participating in national or international competitions, not having a serious injury in the last 6 months, not using alcohol and medication regularly were selected.

Exclusion criteria:

Participants who had less than 5 weekly training sessions, consumed alcohol and regular medication were excluded.

Table 1.

Description statistics of the Participants

	N	Mean	Sd	Minimum	Maximum
Height	24	180.8	6.33	165	189
Body weight	24	72.4	7.44	60.2	91.0
Age	24	24.3	5.42	5	31

Note: mean ± standard error of the mean, N: number of participants.

Data collection

Height, mass, body composition

The height of the athletes was measured in cm with Mesilife (MC-210, Turkey) brand device. Body mass (kg), body mass index (BMI, kg/m2) and fat percentage (%) of the athletes were measured with Tanita (BC418, Japan) device by taking an upright position on the platform with bare feet and wearing only shorts and t-shirt.

Overhead squat

The overhead squat assessment is a dynamic posture assessment that combines shoulder flexion with squatting (sitting to standing). It aims to assess whole body neuromuscular efficiency as well as dynamic flexibility, core strength and balance. Shoulder, lumbo/hip/pelvic, knee and ankle mobilisations were individually observed and angles were noted. The participants repeated the movement 2 times and the scores obtained from each region were noted as overall scores.

Squat jump

For squat jumps, participants were instructed to assume a squatting stance on a force platform (Witty, Italy) and to clasp their hands slightly behind their head to control arm support. Participants were instructed to jump continuously, as explosively as possible, as high as possible for the desired repetitions. Participants repeated the test 2 times and their best times were recorded.

Yoyo Endurance Test

The Yoyo test is a physical fitness test that measures endurance and fitness. Especially popular among athletes, it is used to assess running endurance and speed. The test involves the participant running forwards and backwards along a line and takes place at certain intervals at increasing speeds. The participant starts at one end of a line and runs towards a target at the other end. Then, as soon as he/she reaches the target, he/she turns back and this process is repeated at a certain speed. The speed is indicated by audible signals and the speed increases each time. If the participant fails to reach the target or does not align with the signal sound, the test ends and the last level run is recorded (Thomas et al., 2006).

Results

Table 2.

Pre-post result of measurements

	N	Mean	Sd	Median	SE
Fat (pre)	24	7.4	0.7	7.5	0.15
Fat (post)	24	6.9	0.6	6.95	0.13
Squat jump (pre)	24	40.3	4.9	39.5	0.99
Squat (post)	24	41.5	4.8	41.2	0.97
Overhead Squat (pre)	24	17.3	3.5	16.5	0.71
Overhead Squat (post)	24	19.5	2.1	20	0.43
Yo-yo (pre)	24	1723.3	307.6	1760	62.78
Yo-yo (post)	24	1852.1	335.8	1845	68.55

Note: mean ± standard error of the mean, N: number of participants.

When Table 2 is analysed, fat percentage pre-test 7.43±0.73, post-test 6.99±0.65, squat jump pre-test 40.25±4.9, post-test 41.45±4.8, overhead squat assessment pre-test 17.33±3.5, post-test 19.50±2.1 and yoyo pre-test 1723.3±307.6, post-test 1852.08±335.8 were found.

Table 3.

T-Test results

Measurements		statistic	p
Fat (pre)	Fat (post)	7.46	< .001
Squat jump (pre)	Squat (post)	-4.65	< .001
Overhead Squat (pre)	Overhead Squat (post)	-5.72	< .001
Yo-yo (pre)	Yo-yo (post)	-4.51	< .001

Note. H_a $\mu_{\text{Measure 1 - Measure 2}} \neq 0$; mean ± standard error of the mean, N: number of participants.

According to t-test data, statistically significant differences were found in fat percentage (7.46), squat jump (-4.65), overhead squat evaluation (-5.72), and yoyo (-451) (<.001).

Disscusions

According to the results obtained as a result of the study, fat percentage pre-test 7.43±0.73, post-test 6.99±0.65, squat jump pre-test 40.25±4.9, post-test 41.45±4.8, overhead squat evaluation pre-test 17.33±3.5, post-test 19.50±2.1 and yoyo pre-test 1723.3±307.6, post-test 1852.08±335.8 were found. According to t-test data, statistically significant differences were found in fat percentage, squat jump, overhead squat evaluation and yoyo data (<.001). The pre-season preparation period is a critical period to improve the physical capacity of athletes and to eliminate deficiencies. Various performance and movement assessment tests used in this period provide data to optimise both individual and team performance. Squat jump, overhead squat and Yo-Yo tests are three basic tests that are frequently used in football training and focus on measuring different physiological parameters. Although each test has different purposes and advantages, when used together they allow for a more comprehensive analysis of the athletes' fitness level.

When the literature is analysed, it is known that athletes have different levels of pre-season readiness. For this reason, it is aimed to bring the physiological levels of the athletes to the same ratio in the 1st preparation period of the training plans. It is known that athletes have high body fat ratios in the tests performed before the season and these ratios start to change with the preparation period. This change in body fat ratios can be attributed to high fat oxidation due to aerobic exercises and oxidative capacity. In our study, results supporting this conclusion were obtained (7.46)(<.001).

Endurance tests are commonly used to assess the aerobic and anaerobic endurance of footballers. In this test, athletes run certain distances at gradually increasing speeds and take short rest periods after each set. The test is valuable for measuring the repetitive sprinting ability required by football matches. Footballers who obtain high scores in the Yo-Yo test can play at a high tempo throughout the match and show signs of fatigue later. Kartal and Günay (1994) found 53.05 ml/kg/min in the pre-test and 55.62 ml/kg/min in the post-test and found a statistically significant difference. İşleyen stated in his study that there was a significant difference in pre-season preparation studies. Helgerud et al. reported a significant increase in Vo2max levels. There are studies supporting these in the literature. The studies conducted by Raven et al, Filaire et al, Zizis (2013), Chin et al emphasise the development of endurance. It is in parallel with and supports the results obtained in our study.

The overhead squat analyses disturbances in movement patterns, joint mobility and postural stability. Since this test requires coordination of the shoulder, hip, knee and ankle

joints, it assesses the flexibility and balance skills of footballers. It is important for footballers to have optimal movement capacity in order to minimise the risk of injury. For example, deficiencies in hip and ankle mobility can lead to difficulties during sprinting or knee injuries. Squat jump test provides important information about the explosive power of athletes. Uğraş et al. reported a significant increase in leg strength, jumping and flexibility outcomes according to physical performance data as a result of a 10-week preparation programme. Whitley et al. reported an increase as a result of a 10-week pre-season training plan. According to the findings obtained in our study, it can be clearly stated that there is a significant increase in squat jump and strength data and it is in parallel with the literature.

Conclusions

Squat jump, overhead squat and Yo-Yo tests are important tools to comprehensively assess the physical performance of footballers during pre-season preparation. Each test provides information about the strength, mobility and endurance levels of football players by focusing on different physiological parameters. Individualised training programmes based on the test results help athletes to improve their deficiencies and reduce the risk of injury. In this way, a team structure that exhibits high performance at the beginning of the season and can maintain its form throughout the season can be created.

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Comparative Study Between The Heavy Duty Training Method And The Classical Training Method

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Abstract

Purpose: The study aims to compare the effectiveness of the Heavy Duty training method with the classical method in the development of muscle strength and hypertrophy, focusing on the biceps brachii and triceps surae muscle groups.

Methods: The research was conducted over a period of 6 months at Panoramic Gym in Arad, involving a sample of 45 volunteers randomly divided into two groups: an experimental group (E.G.) and a control group (C.G.). The E.G. followed the Heavy Duty training method, while the C.G. followed the classical method. Strength tests (pull-ups and calf raises) and anthropometric measurements (arm and calf circumference) were used. Data were analyzed using arithmetic mean and standard deviation.

Results: The E.G. recorded a 19.9% increase in pull-ups and 9.7% in calf raises, while the C.G. showed increases of 16.5% and 4.9%, respectively. Arm circumference increased by 3.3% in the E.G. and 2.7% in the C.G., and calf circumference by 1.9% vs. 1.5%.

Conclusions: The Heavy Duty method generated superior progress in muscle strength and hypertrophy compared to the classical method, demonstrating greater efficiency in stimulating physiological adaptations through short and intense workouts, suitable for advanced athletes.

Keywords: heavy duty, bodybuilding, momentary muscular failure, hypertrophy, post-exercise recovery

Introduction

The Heavy Duty Training Method

The Heavy Duty training method is a high-intensity training system created and developed by Mike Mentzer. He realized that in order to achieve muscular hypertrophy, it is necessary to adopt a particularly high training intensity. He was among the first bodybuilders to understand that if an athlete correctly regulates training volume and frequency, they can make consistent progress in a relatively short time.

The intensity of effort at a given moment represents the percentage indicating the share of that effort relative to the maximum momentary muscular effort possible (Mentzer & Little, 2002).

High-intensity training is the only one capable of stimulating the body to use its resources sufficiently to trigger an adaptive response. Repetitive activities that require no more resources than are available will do nothing to stimulate growth. Ending a set before reaching exhaustion, just because an arbitrary number of repetitions was planned, will not sufficiently stimulate the muscles to achieve proper hypertrophy.

Performing a set until 100% of the maximum momentary muscular effort is required is the most important factor in the process of strength and muscle hypertrophy development (Mentzer, 1996).

Executing a set to momentary muscular failure ensures the surpassing of the so-called "critical level," below which hypertrophy will not be stimulated, and above which the hypertrophy process is triggered (Herlo, 2005).

Regarding post-exercise recovery and muscular hypertrophy, we are dealing with two distinct physiological processes, both of which require a certain amount of time to occur. When training is prolonged or rest periods between sessions are too short, hypertrophy will suffer.

Sports training practice shows that 2–3 sets per exercise (excluding warm-up sets) are sufficient to stimulate hypertrophy when using the Heavy Duty method. This training method is intended exclusively for athletes at an advanced training stage.

The Classical Training Method

The classical bodybuilding training method states that to stimulate muscular hypertrophy, an intensity of 60–85% of the current muscular capacity is sufficient.

Bodybuilding-specific training is characterized by anaerobic lactic effort, relying on glycogen as an energy substrate. The energy needed for the effort is produced through the glycogen–lactic acid energy system (Lupea, 2000).

Effort duration typically ranges from 40 to 60 seconds (the length of a set), followed by rest periods of 60 to 150 seconds. The rest duration between sets is closely related to the goal of the training: if the aim is hypertrophy, the rest period tends toward the upper limit; if the goal is muscle definition, the rest is shorter, following Weider's quality training principle (Herlo, 2005).

Classical bodybuilding training involves a series of highly specialized training concepts known in literature as "Weider Principles". These principles stem from general training principles and are adapted derivatives (Voicu, 1995).

It is important to note that a set should not end simply because it was planned that way, but only when momentary muscular failure is reached—when no further repetition can be performed (Chirazi & Ciorbă, 2006).

If a set is arbitrarily stopped at a given moment, the effectiveness of the training is practically compromised.

In conclusion, for a bodybuilding workout to be maximally efficient, it is recommended that "its duration not exceed 60 minutes, that it be sufficiently intense to produce adaptive changes in muscle fibers, and that basic exercises be performed in strict form" (Herlo, 2005).

Methods

Application of the Heavy Duty Method in Specific Training

In bodybuilding-specific training using the Heavy Duty method, a high load is always used—one that allows for the maximum proposed number of repetitions.

Since the goal in this case is muscle mass increase, the number of repetitions is set around 7.

Targeted muscle group: Biceps brachii

Exercise: Barbell curls from standing

- 2 warm-up sets with low load (20–30% 1RM), performed progressively
- Set 1: 6–8 repetitions
- Set 2: 6–8 repetitions
- Set 3: only if necessary (if momentary muscular failure was not reached)

Targeted muscle group: Calves (triceps surae)

Exercise: Standing calf raises on the machine

- 2 warm-up sets with low load (20–30% 1RM), performed progressively
- Set 1: 6–8 repetitions
- Set 2: 6–8 repetitions
- Set 3: 6–8 repetitions

As shown in the training structure above, the Heavy Duty method involves reducing the number of sets per exercise and increasing the working intensity. The goal is to reach momentary muscular failure using a minimal number of sets. The underlying idea is that training should be short and intense, triggering adaptive processes without entering a catabolic state.

Application of the Classical Training Method

Targeted muscle group: Biceps brachii

Exercise: Barbell curls from standing: 5 sets x 6–8 repetitions

Exercise: Alternating dumbbell curls from standing: 5 sets x 6–8 repetitions

Targeted muscle group: Calves (triceps surae)

Exercise: Seated calf raises on the machine: 6 sets x 10–12 repetitions

Exercise: Standing calf raises with barbell on the neck: 6 sets x 10–12 repetitions

Experimental Design

The study was conducted at the Panoramic Gym in Arad over a period of 6 months, structured as a longitudinal experiment.

The experiment involved 45 participants, all subscribers at Panoramic Gym. Subjects were randomly selected on a voluntary basis and divided into two groups: the experimental group (E.G.) and the control group (C.G.).

E.G.: 23 subjects trained using the Heavy Duty method

C.G.: 22 subjects trained using the classical method

The independent variable (I.V.) for the E.G. was the exercise structure aimed at developing the biceps brachii and triceps surae using the Heavy Duty method:

For biceps brachii: barbell curls from standing

For triceps surae: standing calf raises on the machine

Statistical indicators used in the analysis included:

Arithmetic mean ($\bar{x}$)

Standard deviation (σ)

Results

The subjects involved in the experiment were tested to determine the strength of the biceps brachii and triceps surae muscles. Anthropometric measurements were also taken at the arm and calf level to determine the circumferences of the respective areas.

At the end of the testing process, regarding the strength of the biceps brachii and triceps surae muscles, we obtained the following results:

The results obtained by the subjects in the experimental group (E.G.) in the initial testing – arithmetic average:

- Pull-ups on the fixed bar: 12.86 repetitions
- Heel raises on the machine: 18.73 repetitions
- Arm circumference: 34.21 cm
- Calf circumference: 37.52 cm

Thus, we observe that the E.G. subjects achieved an average of 12.86 repetitions in the pull-up test, with an average arm circumference of 34.21 cm. Regarding lower leg strength, the subjects performed an average of 18.73 repetitions, with an average calf circumference of 37.52 cm.

The results obtained by the subjects in the control group (C.G.) in the initial testing – arithmetic average:

- Pull-ups on the fixed bar: 11.81 repetitions
- Heel raises on the machine: 16.5 repetitions
- Arm circumference: 33.68 cm
- Calf circumference: 35.9 cm

Based on these values, we observe that the C.G. subjects achieved an average of 11.81 pull-up repetitions, with an average arm circumference of 33.68 cm. Regarding calf muscle strength, the subjects performed an average of 16.5 repetitions, with an average calf circumference of 35.9 cm.

The results obtained by the E.G. in the final testing – arithmetic average:

- Pull-ups on the fixed bar: 15.43 repetitions
- Heel raises on the machine: 20.56 repetitions
- Arm circumference: 35.34 cm
- Calf circumference: 38.26 cm

Thus, we observe that the E.G. subjects achieved an average of 15.43 pull-up repetitions, with an average arm circumference of 35.34 cm. Regarding calf strength, the subjects performed an average of 20.56 repetitions, with an average calf circumference of 38.26 cm.

The results obtained by the C.G. in the final testing – arithmetic average:

- Pull-ups on the fixed bar: 13.77 repetitions
- Heel raises on the machine: 17.31 repetitions
- Arm circumference: 34.59 cm
- Calf circumference: 36.45 cm

Thus, we observe that the C.G. subjects achieved an average of 13.77 pull-up repetitions, with an average arm circumference of 34.59 cm. Regarding calf strength, the subjects performed an average of 17.31 repetitions, with an average calf circumference of 36.45 cm.

From the analysis of the data presented above, we can state the following:

- The E.G. results for the "pull-ups on the fixed bar (supine grip)" exercise increased by 19.9%, and for the "heel raises on the machine" exercise by 9.7%;
- The average arm circumference in the E.G. increased by 3.3%, and the average calf circumference by 1.9%.
- The control group's (C.G.) monitoring results are summarized as follows:
- The C.G. results for the "pull-ups on the fixed bar (supine grip)" exercise improved by 16.5%, while for the "heel raises on the machine" they increased by 4.9%;
- The average arm circumference in the C.G. increased by 2.7%, and at the calf level the increase was 1.5%.

In this context, we observe an increase in biceps brachii strength of 3.4% greater in the E.G. compared to the C.G., while for calf muscle strength, the increase was 4.8% greater in the E.G. than in the C.G.

Regarding the increase in the circumferences targeted in the experiment, there is an increase of 0.6% in arm circumference and 0.4% in calf circumference, in favor of the E.G. For a graphical representation of these results, refer to Annex No. 1.

Regarding the degree of dispersion in the studied groups, we observe that:

For the pull-ups on the fixed bar exercise:

- Initial testing in the E.G.: $\sigma = \pm 2.37$
- Final testing in the E.G.: $\sigma = \pm 2.04$

For the heel raises on the machine exercise:

- Initial testing in the E.G.: σ = ± 3.52
- Final testing in the E.G.: σ = ± 3.11

For the arm circumference:

- Initial testing in the E.G.: σ = ± 1.65
- Final testing in the E.G.: σ = ± 1.02

For the calf circumference:

- Initial testing in the E.G.: σ = ± 2.4
- Final testing in the E.G.: σ = ± 2.09

For the pull-ups on the fixed bar (supine grip) exercise:

- Initial testing in the C.G.: σ = ± 1.53
- Final testing in the C.G.: σ = ± 1.71

For the heel raises on the machine exercise:

- Initial testing in the C.G.: σ = ± 2.19
- Final testing in the C.G.: σ = ± 2.07

For the arm circumference:

- Initial testing in the C.G.: σ = ± 1.42
- Final testing in the C.G.: σ = ± 1.05

For the calf circumference:

- Initial testing in the C.G.: σ = ± 1.6
- Final testing in the C.G.: σ = ± 1.53

For a clearer view, the results presented above can be visualized in Table No. 1.

Table 1.

Standard Deviation and Arithmetic Mean for the Two Groups

Exercise/ Parameter		**E.G. Primary Testing**	**E.G. Final Testing**	**Difference**	**C.G. Primary Testing**	**C.G. Final Testing**	**Difference**
Arithmetic Mean	Pull-ups on fixed bar	12.86	15.43	2.57	11.81	13.77	1.96
	Heel raises on machine	18.73	20.56	1.83	16.5	17.31	0.81

Exercise/ Parameter		E.G. Primary Testing	E.G. Final Testing	Difference	C.G. Primary Testing	C.G. Final Testing	Difference
	Arm circumference (cm)	34.21	35.34	1.13	33.68	34.59	0.91
	Calf circumference (cm)	37.52	38.26	0.74	35.9	36.45	0.55
Standard Deviation	Pull-ups on fixed bar	± 2.37	± 2.04	± 0.33	± 1.53	± 1.71	± 0.18
	Heel raises on machine	± 3.52	± 3.11	± 0.41	± 2.19	± 2.07	± 0.12
	Arm circumference (cm)	± 1.65	± 1.02	± 0.63	± 1.42	± 1.05	± 0.37
	Calf circumference (cm)	± 2.4	± 2.09	± 0.31	± 1.6	± 1.53	± 0.07

Conclusions

Thus, it can be observed that both groups exhibited a low degree of dispersion, with standard deviation values being relatively small.

Following this research and based on the results obtained, we conclude that the use of the "Heavy Duty" training method yields higher efficiency in terms of muscle hypertrophy and strength development compared to the classic training method.

From the analysis of the previously presented data, the following observations can be made:

- The number of repetitions performed by the Experimental Group (E.G.) in the “pull-ups on a fixed bar, supinated grip” exercise increased by 19.9%, while in the “heel raises on the machine” exercise, the increase was 9.7%;
- The average arm circumference in the E.G. increased by 3.3%, while the calf circumference increased by 1.9%.
- The control results, obtained by the Control Group (C.G.), are summarized as follows:
- In the “pull-ups on a fixed bar, supinated grip” exercise, an increase of 16.5% was recorded, while in the “heel raises on the machine” exercise, the increase was only 4.9%;
- The average arm circumference in the C.G. increased by 2.7%, while the calf circumference increase was just 1.5%.

Therefore, it is evident that the strength of the biceps brachii increased by 3.4% more in the E.G. compared to the C.G., and in terms of calf muscle strength, the increase was 4.8% higher in the E.G.

Regarding the increase in the measured circumferences in the experiment, a 0.6% greater increase in arm circumference and a 0.4% greater increase in calf circumference were observed in favor of the E.G.

For a graphical representation of these results, see Annex No. 1.

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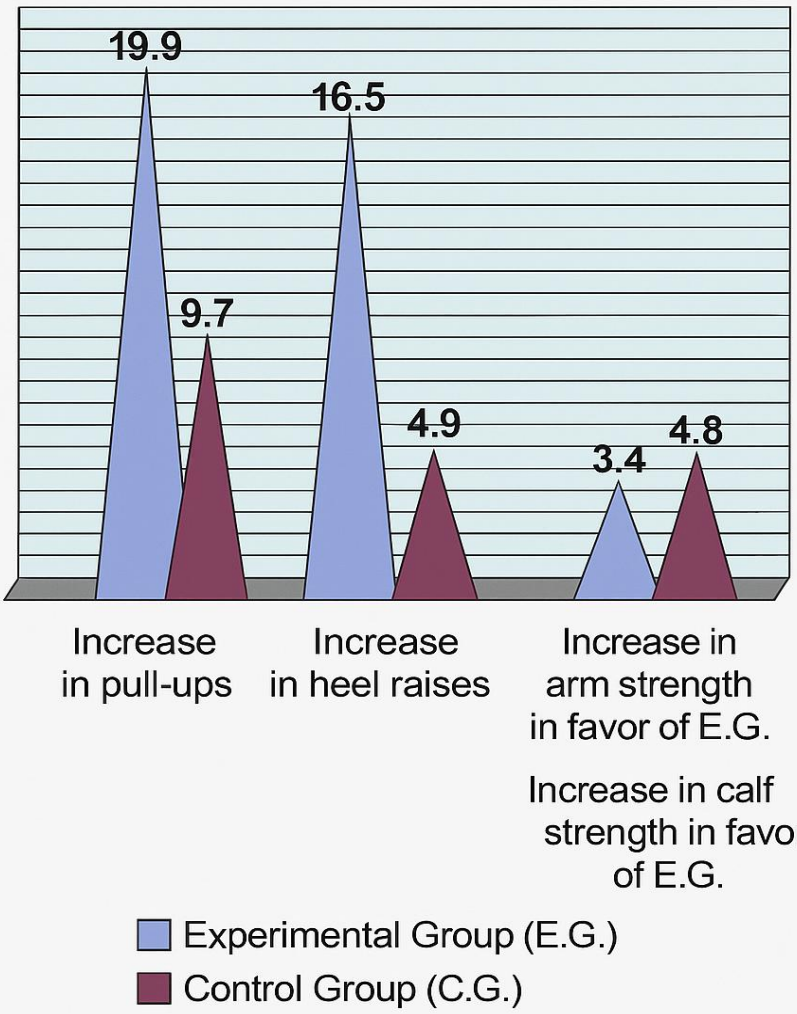
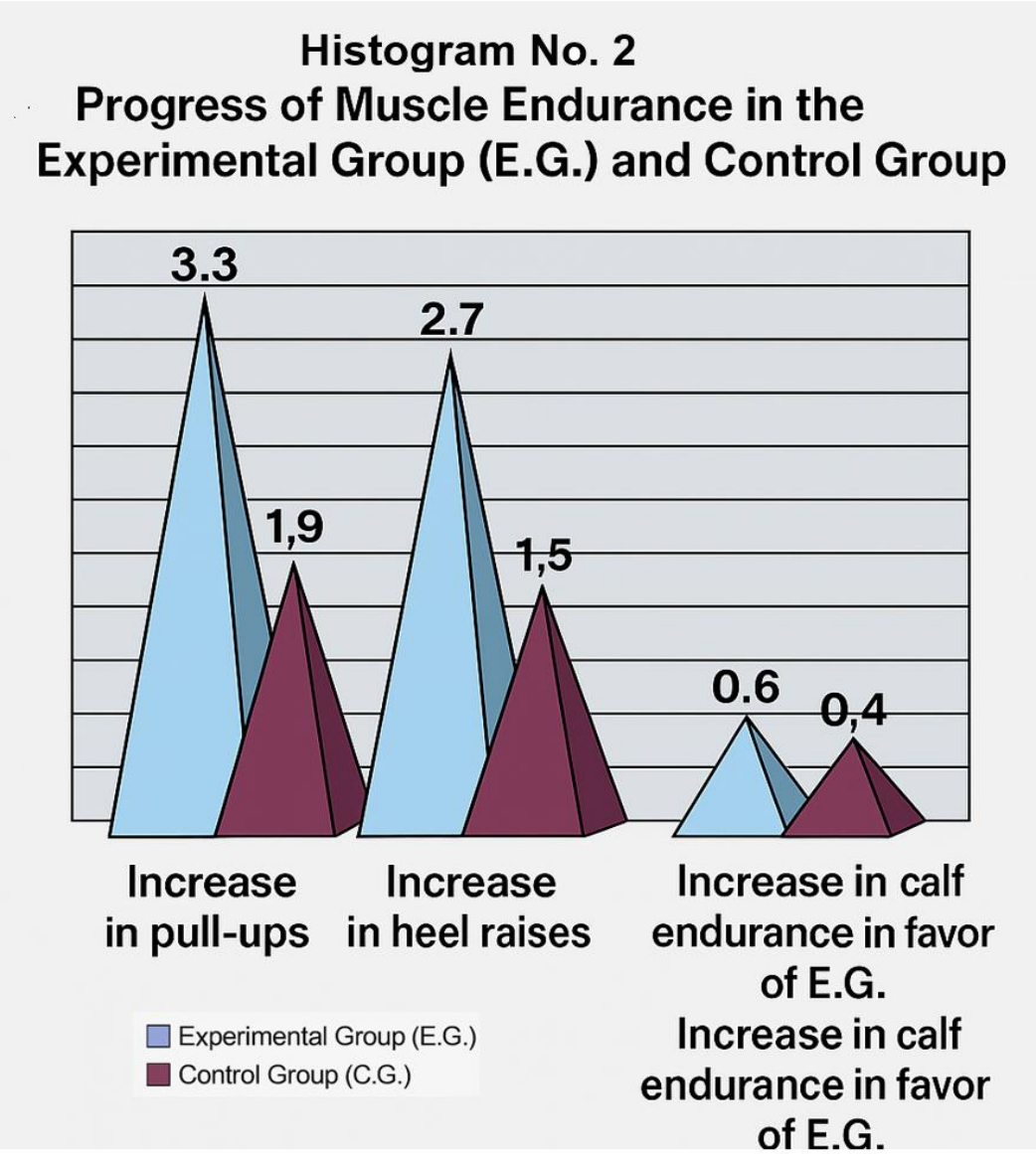
Annex

ANNEX No. 1
Histogram No. 1
Progress of Arm and Calf Mus cle Strength
in the Experimental Group (E.G.) and Control Group)




Histogram No. 2
Progress of Muscle Endurance in the Experimental Group (E.G.) and Control Group
3.3
1,9
2.7
1,5
0.6
0,4
Increase in pull-ups
Increase in heel raises
Increase in calf endurance in favor of E.G.
Experimental Group (E.G.)
Control Group (C.G.)
Increase in calf endurance in favor of E.G.

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Effective Methods For Assessing General Strength In High School Students

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Abstract

Physical education and sports have particularly large social tasks, and this aspect constitutes a signal of attention for physical education and sports teachers, as high school students are approaching the completion of biological growth

The motor quality strength is present in school curricula at each level of study. In the preparation of students, interdependent relationships are created between the components of the preparation, between the development of motor qualities, the development of morpho-functional indices and the acquisition of motor skills. As research objectives, we aimed to: carry out initial testing on 4 control samples in different classes of the high school cycle and in SAM classes; go through a system of lessons intended for the development of the motor quality strength, a system with increasing intensity and complexity from one year of study to another; establish a set of measures necessary to improve the current teaching and evaluation system in the discipline "Physical Education". The materials, methods and means used were adapted to the working conditions in an improvised gym, with reduced height, width and length. We specify that there is no possibility of developing strength in a coherent system of lessons due to the delicate period we are going through. The development of motor qualities is necessary to achieve the other requirements of the curriculum. Knowing the level of development of the motor quality strength, as well as its evolution curve is of particular importance, therefore, as results, correlating the data obtained from parallel classes, for each test, as well as for the

evolutions recorded in them over the course of one or two years, the values obtained are calculated, differentiated for boys and girls

Keywords: biomotor potential, motor qualities, strength, physical education

Introduction

Researching the biomotor potential of schoolchildren is a topic of constant relevance, which continues to concern specialists in the field of physical education and sports. In this paper, we aim to know the level of development of a component of the biomotor potential (motor quality strength), as well as its evolution curve during the high school years, understanding by this the recording and interpretation of data following the periodic control tests, after having previously gone through a system of lessons intended for its development (Avramoff,1982).

Starting from the premise that general strength does not have an evaluation method in the National School Evaluation System for the discipline of physical education and sports, we issued the following research hypothesis: if we systematically use the circuit method and the applicative paths in Physical Education lessons with students in high school classes, then we can achieve a progress in the strength indices of the main muscle groups (Brata,1996).

The research aimed to:

- conducting initial testing on 4 control tests in different classes of the high school cycle and in SAM classes.
- going through a system of lessons aimed at developing motor quality and strength, a system with increasing intensity and complexity from one year of study to another.
- conducting final testing on the same 4 tests.
- establishing a set of measures necessary to improve the current teaching and evaluation system in the discipline "Physical Education".

Motor qualities are characteristics of the body that offer the individual the possibility of performing various motor acts, related to both his daily and sports activities. They are the characteristics that determine movement, a result of the entire organism. So, even if the motor act is performed by the locomotor apparatus, it functions based on the command of the nervous system and drives the functionality of all apparatuses and systems. In the educational process, an important place among the concerns of the specialized teacher is occupied by finding and using in preparation the most effective methods and means that ensure the development of these qualities (Chirazi ,2006).

Regarding the optimal age for a favorable influence on the development of motor skills, we note that speed can be developed with very good results at the age of 10-12, but the activity of educating it in various forms can begin at 5-6 years. The skill develops well between the same age limit as speed. Strength and endurance, motor skills that are more easily perfected,

can be systematically educated from 9-10 years old, with an ascending evolution and maximum possibility of improvement (Lupea ,2000). Strength is the ability of the neuromuscular apparatus to overcome resistance through movement, the basis of muscle contraction being the result of either the increase in internal tension of the muscle fiber (isometric effort) or the shortening of the muscle fiber (isotonic effort),(Sava, 2014). In the specialized literature we find numerous definitions of this quality, all of which have one thing in common: muscle contraction. Thus, Zaţiorski gives the following definition of strength: "the human capacity to manifest through muscular effort certain values of overcoming force (with shortening or lengthening of the muscles), maintaining force (without changing the length of the muscles) or yielding force.2.

As a result of the current situation, related to the pandemic period, but also to the national situation of the way physical education classes are conducted, this research took place in Arad County, in a high school located in one of the neighboring cities. The teaching staff, through whose kindness we had access to physical education lessons, Mrs. Grade 1 Teacher N. S., provided us with everything that was necessary and useful in conducting our research (Mateescu,2007).

The students of the 2 9th grades took tests on the following 4 tests

- push-ups from support lying on the ground
- long jump from the spot
- raising the trunk from supine position with hands on the back
- extension of the trunk from face position with hands on the back

In order to carry out the study, the learning unit "strength" was placed within the annual planning as the main learning unit during the period November-February, therefore during the work in the gym, for 14 weeks.

Strength development was placed in the 6th link of the lessons, for a duration of 15-20 minutes, depending on the class and the level of development of the targeted motor quality. The exercises are differentiated according to gender and level of training. The difficulty of the exercises and their duration increases from one week to another and from one year of study to another, as can be seen in the next chapter (Mentzer,1996,2002).

Methods

The materials, methods and means used were adapted to the working conditions in an improvised gym, with reduced height, width and length. We specify that there is no possibility of developing strength in a coherent system of lessons due to the delicate period we are going through.

The study was conducted between November 15, 2023 and April 1, 2024. The actions were scheduled during physical education classes during 28 lesson systems - 14 weeks aimed at developing motor quality and strength. In order to determine the effectiveness of the exercises used, initial and final checks were carried out

In order to carry out the study, the learning unit "strength" was placed in the annual planning as the main learning unit during the period November-February, therefore during the work in the gym, for 14 weeks. Due to the conditions of conducting physical education classes outdoors at a considerable distance from school, this learning unit cannot be approached with maximum efficiency except in the gym, during the winter.

The lessons of the first week were allocated to the initial testing in all classes for the following tests:

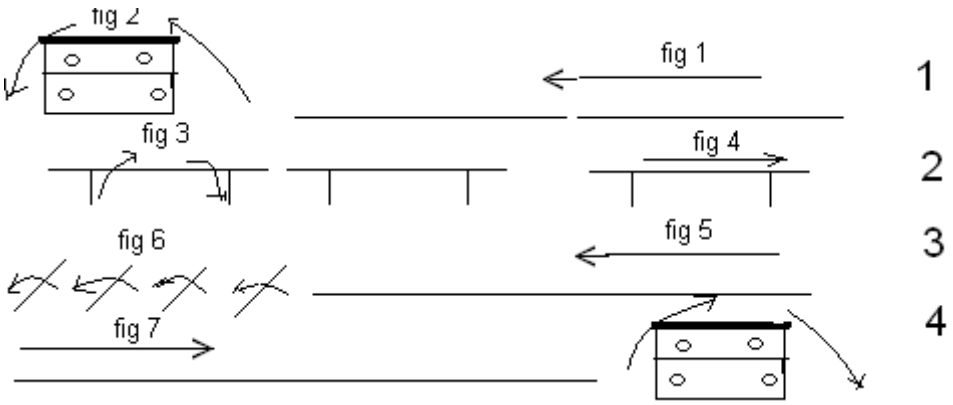
- push-ups from support lying on the ground
- long jump from a standing position
- raising the trunk from a supine position with hands on the back of the head
- extension of the trunk from a face-up position with hands on the back of the head

The following two weeks of the lesson system intended for the development of strength include an applicative course with known elements, the difficulty of which increases depending on the class for which it is intended. In weeks 4-5, the elements of the application course are placed within application relays, thus eliminating the monotony of the lessons. Weeks 6-9 include two short circuits, depending on the existing conditions, and in weeks 10-13, frontal work is carried out. The last week is intended for final testing on the same four tests that were taken during the initial testing.

Strength development was placed in the 6th link of the lessons, lasting 15-20 minutes, depending on the class and the level of development of the targeted motor quality. The exercises are differentiated according to gender and level of training. The difficulty of the exercises and their duration increases from one week to another and from one year of study to another, as can be seen in the next chapter.

Figure 1.

Applicative course for 9th grade



The group of students is divided into four equal groups, rotating after the established working time. Two circuits were designed for each class, one for the first two weeks and one for the next two, thus avoiding monotony.

CIRCUIT I

- push-ups on the knees – girls
- push-ups from a lying position – boys
- half-squats with a jump
- from a support on the elbows, bringing the knees to the chest – girls
- from a support on the elbows, raising the legs extended vertically – boys
- from a face-down position, simultaneously raising the torso and legs in extension

CIRCUIT II

- pull-ups – boys
- push-ups with hands on the bench – girls
- successive jumps on two benches placed parallel
- from lying face down with hands behind the back, legs supported – raising the trunk in extension
- from lying supine, simultaneously raising the trunk and legs – boys
- from sitting cross-legged on the bench, raising the knees to the chest – girls

Two sets of the circuit will be performed every hour, working for 20 seconds, with a 20-second break. The break between sets will be 2 minutes.

Results and Discussions

Correlating the data obtained from the parallel classes, for each sample, as well as for the developments recorded in them over the course of one or two years, the following are calculated, differentiated for boys and girls:

- number of records: the number of students who were subjected to the study;
- arithmetic mean: the sum of the terms of the series divided by their number;
- minimum
- maximum
- amplitude: the difference between the extreme values of the distribution;
- median: the point above which 50% of the set of values is located.

Table 1.

Results recorded by research subjects in the Push-ups test

No. crt	Statistical quantities	Initial evaluation		Final evaluation		Progress	
		B	G	B	G	B	G
1.	Number of records	22	48	22	48	22	48
2.	Arithmetic mean	20,77	5,9	27,5	9,14	6,7	3,25
3.	Minimum	2	0	5	0	2	0
4.	Maximum	50	20	55	25	13	7
5.	Amplitude	48	20	50	25	11	7
6.	Median	19,5	4	27,5	10	6	3

Figure 2.

Graphical representation of the results of the Push-ups test - b

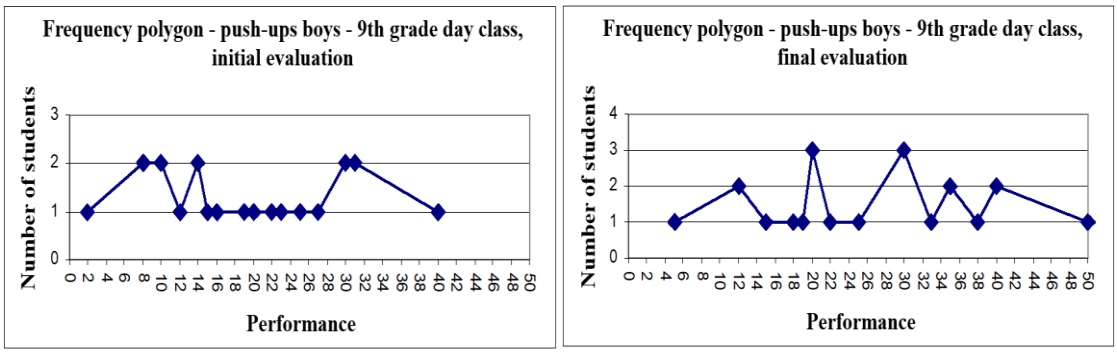
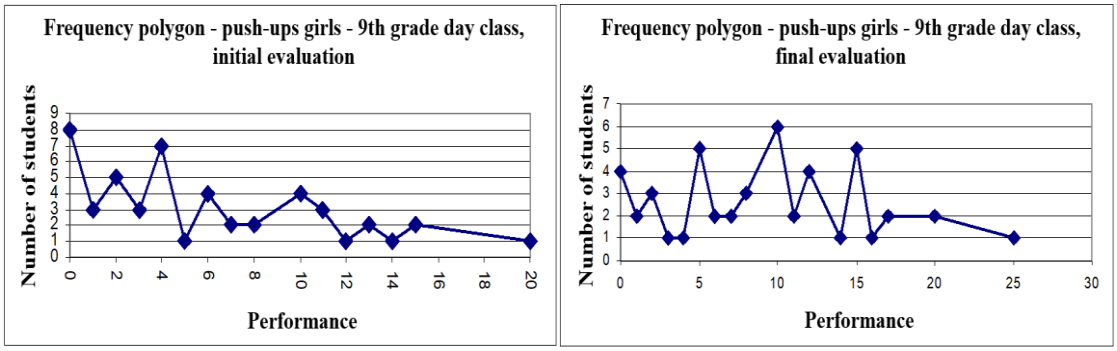


Figure 3.

Graphical representation of the results of the Push-ups test – g



In contrast, girls had 8 performances of 0(zero) push-ups initially, and a median of 4, meaning 50% of them did less than four push-ups. However, their progress is not negligible, with only 4 cases of 0(zero) push-ups ultimately being recorded, a median of 10, 83% recording progress of up to 5 push-ups and 17% a progress between 6 and 10 push-ups.

Table 2.

Results recorded by the research subjects in the Long Jump test

No. crt	**Statistical quantities**	**Initial evaluation**		**Final evaluation**		**Progress**	
		B	G	B	G	B	G
1.	Number of records	22	48	22	48	22	48
2.	Arithmetic mean	1,96	1,49	2,11	1,6	0,15	0,1
3.	Minimum	1,3	1	1,5	1,1	0,1	0
4.	Maximum	2,6	2,05	2,7	2,15	1,2	0,2
5.	Amplitude	1,3	1,05	1,3	1,05	0,1	0,2
6.	Median	2,02	1,47	2,15	1,57	0,15	0,1

Figure 4.

Graphical representation of the results in the Long Jump from the spot –b

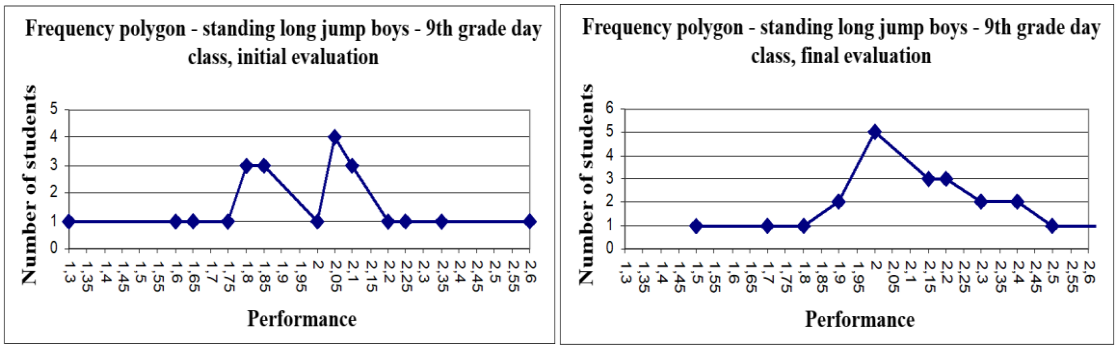
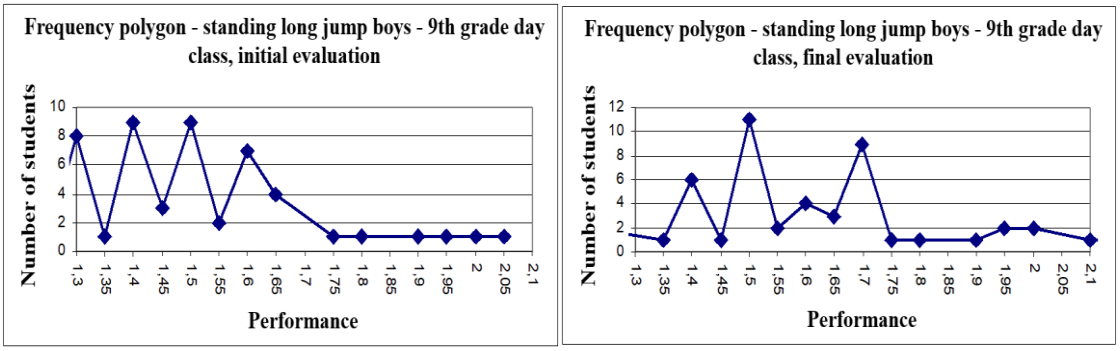


Figure 5.

Graphical representation of the results in the Long Jump event - g



Following the completion of the experiment, the interpretation of the results obtained in the research, we developed the conclusions, discussing also what would be required at the level of the Framework Plan, but also about the revision of the School Evaluation System in the Physical Education and Sports Discipline.

Below we present the summary of the conclusions and discussions:

Strength development is one of the primary objectives of physical education. It is important because it is the basis for the acquisition of motor skills, promotes the increase of effort capacity, ensures harmonious physical development, its improvement can be done in simple conditions and can be a particularly attractive activity.

The level of development of the targeted motor quality in the current generation of students is on average within good limits. It is necessary to give even greater importance to the development of strength in middle school classes and even in primary school classes because the level of this motor quality influences the development of morpho-functional indices and the acquisition of motor skills. Thus, it is the basis for achieving the other requirements of the curriculum.

None of the students included in the study regressed. Each student progressed or stagnated. Thus, we can conclude that the lesson system used was effective.

At the high school level, special importance must be given to the development of the strength of all muscle groups because students are approaching the completion of biological growth, this being the age conducive to its development. Thus, a more adequate selection of the capacities and competencies evaluated would be necessary, in accordance with one of the main objectives of physical education: harmonious physical development. We can observe that the assessment of the strength of the back muscles is missing in the 9th grade. It appears only in the 10th grade of high school, not being addressed in the 11th and 12th grades. We recommend including in the curriculum for each grade the assessment of the level of development of all muscle groups, ensuring continuity in their development and implicitly a positive influence on the state of health and on the physical attitude.

It is necessary to revise the School Evaluation System for the Physical Education and Sports Discipline.

The provision of requirements only for awarding a grade of 5 (five) can no longer be maintained under the conditions in which national unitary evaluation standards for educational disciplines will be developed.

Providing tests whose lack of difficulty allows for a large volume of executions unnecessarily consumes lesson time.

Solving special individual situations in which students may find themselves, generated by atypical morphological and functional particularities, restricted for certain categories of effort, with physical deficiencies, in postoperative periods.

Adapting to the diversity of conditions in which the educational process in this discipline is carried out.

The framework plan also requires a review of the number of hours allocated to the Physical Education and Sports discipline in high school classes. We consider it necessary to allocate a minimum of two hours per week of physical education. These are necessary to ensure an appropriate density of effort in a week, an effective contribution to maintaining health, to compensating for intense intellectual efforts, to the positive evolution of motor capacity.

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Effectiveness Of Massage In Recovery From Exercise-Induced Muscle Injury In Older Adults

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Abstract

The study aims to evaluate massage as a recovery method for joint position, and balance after exercise-induced muscle injury in older adults. One hundred and seventy-five elderly patients performed an exercise session targeting the calf muscles (five exercises, six sets of 15 repetitions to induce muscle damage). The objectives of the study are to evaluate the role of massage and the Scottish cold shower in the recovery of older adult patients. After training, the participants underwent one of the recovery interventions: a 20-minute massage on the calves, a 12–15-minute Scottish cold shower on the lower limbs (12.5 ± 1°C). These interventions were administered immediately after exercise and again at 24, 48 and 72 hours over a period of 21 days. Conclusions: the measurements taken each time included muscle pain, joint position, and postural-balance balance. The treatments and the time allocated to repetitive massage significantly reduced muscle pain and improved balance. Conversely, although they alleviated muscle pain, they did not effectively prevent loss of muscle strength, balance deficits. Therefore, older people who engage in strength training can benefit from massage for longer to help with muscle recovery, improve balance, and reduce the risk of falls.

Keywords: massage, recovery time, muscle pain, stable and unstable balance, exercise.

Introduction

A decrease in muscle mass and strength is a typical aspect of aging (Akima et al., 2000), these changes being more pronounced in the leg muscles than in other muscle groups. This contributes significantly to an increased risk of falling (Vandervoort, 2002). Research indicates that after the age of 65, muscle mass decreases (Caught, 1978) by about 10% per decade, while muscle strength decreases by 26% to 41%. Of particular concern is the fourfold increase in the risk of falling due to muscle weakness (Delbaere et al., 2010) and atrophy. Strength training is widely recommended (Chirls, 1973) to counteract and even reverse these age-related declines in muscle function and motor control, thereby reducing the risk of falling (Fragala et al., 2019).

However, many older adults already struggle with reduced muscle mass, strength, and sense of joint position, making them more vulnerable to balance impairments (Dirks et al., 2014; Bean et al., 2004) stable and unstable. Additional deficits caused by exercise-induced muscles can further compromise postural control (Meshkati et al., 2011) and stability. Moreover, the pain and discomfort associated (Winter, 2009) with exercise-induced muscles may discourage older adults from engaging in workouts and intense physical activity. Therefore, when recommending strength training for older people, it is essential to consider both its long-term benefits and the short-term effects of different training protocols. Implementation of effective recovery interventions that relieve muscle injuries (Harridge et al., 1999; Rubenstein, 2006), improve balance and reduce the risk of falling.

Various recovery strategies have been explored to address exercise-induced muscle deficiencies. In addition to nutrition-based approaches, immersion or treatment with alternative cold-water jets and massage are frequently used techniques (Machado et al., 2016). While previous studies have investigated the effects of these methods on muscle strength and sense of joint position, most research has focused on younger populations. Treatment with alternate cold-water jets or immersion in cold water is believed to aid recovery by reducing muscle inflammation, minimizing swelling, and relieving pain. By decreasing muscle perfusion, or treatment with alternative jets of cold water can also prevent damage to secondary tissues and help restore muscle strength and strength. Proper and timely massage, on the other hand, is believed to facilitate recovery by reducing swelling and pain by eliminating accumulated extracellular fluid. Evidence suggests that massage can improve muscle strength, proprioception (Drouin et al., 2004), physical and overall mental performance after exercise. Some studies have shown that a 30-minute muscle massage after exercise can reduce muscle

soreness and alleviate losses in strength and performance, while a 15-minute gastrocnemian massage can improve strength and proprioception.

Despite these findings, there is a lack of research on the effectiveness of these recovery methods for older adults, particularly in terms of muscle strength, sense of joint position, and balance. Given that lower limb strength and proprioception are key factors influencing overall physical and mental balance and performance (Lexell, 1995), further investigations into these recovery techniques could provide valuable information for athletes, coaches, and health professionals. This study aimed to determine whether treatment with alternative cold-water jets or immersion in cold water or massage could serve as effective methods of recovery after strength training by relieving exercise-induced muscle-related symptoms, especially decreased muscle strength, sense of joint position, balance in older adults. It has been hypothesized that both treatment with alternative cold-water jets and massage would be more effective than passive recovery in reducing these deficiencies and promoting post-exercise recovery.

Materials and Methods

Study design and setting

One hundred and seventy-five healthy older adults (aged 66 ±2 years, height 1.67 ± 0.05 m, weight 81.8 ± 2.7 kg) who consented to start exercising and volunteered for this study. Participants met the inclusion criteria of being at least 60 years of age or older, with no acute history, demonstrating the ability to engage alone without assistance in physical activities.

A medical professional carried out the initial screenings for all volunteers, but for those who were eliminated along the way and were not involved in data collection.

The exclusion criteria were based on a history of similar physical activity in the past 12 months, chronic pain, unstable cardiovascular conditions, or multiple psychiatric, neurological, or inflammatory disorders.

Table 1.

Inclusion and Exclusion Criteria of the Study

Inclusion Criteria	Exclusion Criteria
Adults aged ≥60 years	Patients diagnosed with motor and heart failure
Willing to do short-term and long-term exercise	Patients diagnosed with glenohumeral arthritis or instability
He agreed to the initial and final screenings performed by a medical professional	Patients diagnosed with neurological disorders affecting the shoulder
Willing to undergo a treatment with immersion in cold water or with alternative jets of cold water and massage	He did not agree with the initial and final screenings carried out by a medical professional
Patients who voluntarily provided informed consent for participation in the study	Patients who declined to provide informed consent for participation in the study

This study was a study carried out in groups, in parallel groups, with repeated measurements taken at baseline and at 24, 48 and 72 hours after the intervention.

Group I elderly adult patients who only wanted massage without undergoing a cold-water immersion treatment or alternative cold-water jets.

Group II elderly adult patients who wanted massage treatment and underwent treatment with immersion in cold water or with alternative cold-water jets

The older adult participants then went to a lab for baseline measurements, followed by the strength exercise protocol the next day. This protocol was designed to include standing calf raises with a weight, as well as standing and seated calf raises using a weight machine. After exercise, massage group I received a standardized 20-minute muscle massage, study group II was subjected to a 12-15-minute immersion in water at 12.5 ± 1°C.

Clinical evaluation

Demographic data, including age and gender, were collected for all 175 study participants.

To evaluate the effectiveness of the treatment, measurements and interventions were performed that were repeated 24, 48 and 72 hours after the exercises performed.

Exercise regimen for muscle tone and mobility

Prior to the initial assessments, the maximum exercise of older adult participants was determined for the 2 types of exercises: standing calf raises with a weight. If a participant successfully completed more than 15 repetitions, they rested for 20-25 minutes before attempting the exercise with a heavier weight.

Prior to the main exercise protocol, the older adult participants completed a 5-minute warm-up consisting of walking on a treadmill. After a 10-minute rest time, they performed an intense exercise training session under supervision. The training session consisted of six sets of 15 repetitions for each exercise, with a rest period of 5-10 minutes between sets.

Perceived exertion was measured in older adult participants by verbal ratio, i.e., the level of exertion within ten minutes of the session, specifically referring to how they felt just before completing the exercise.

Follow-up protocol and study endpoints

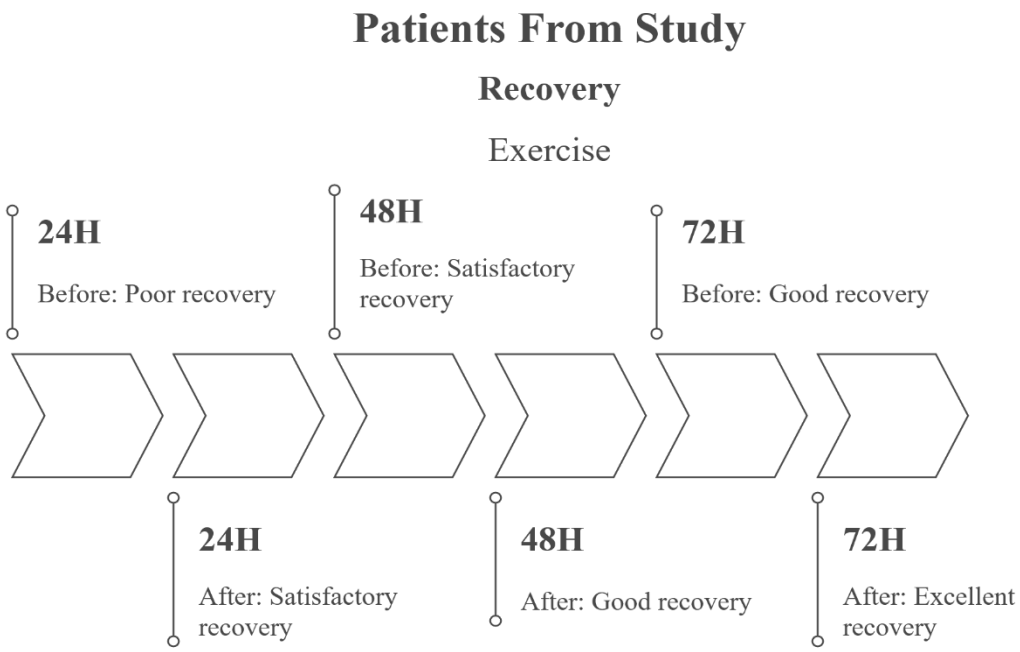
All patients followed a structured follow-up protocol to assess treatment efficacy and safety Older adult participants assessed their muscle pain using a VAS scale where 0 represented no pain and 10 indicated extreme pain. This method has been successfully used in research in the literature to track changes in pain perception after exercise.

Results

The patients were divided into age groups and were monitored according to the response to treatment during the three time intervals and had a standardized exercise protocol, adapted according to age.

Figure 1.

Distribution and evolution of patients by hours and treatment groups



For massage group I, a standardized 20-minute massage was administered to the calf muscles immediately after the exercise protocol. The therapist used various massage techniques, including effleurage, petrissage, and vibration. The massage began with 4-5 minutes of effleurage, which involved light caresses with the palms around the popliteal area, the Achilles tendon and the calf muscles. Then, 8 minutes of kneading techniques were applied, including kneading, two-handed circular lifting, and calf muscle pressing. Between kneading techniques, a 2-minute vibration was added, followed by a final 3 minutes of effleurage over the calf muscles.

Group II of elderly adult patients who had massage treatment and underwent a treatment with immersion in cold water or with alternative jets of cold water, alternated the massage with cold showers of water for about 60 minutes.

There were no significant differences between the two groups in terms of age, height, body mass and BMI after randomisation, and baseline measurements and training tasks were similar between groups (Table 2).

The results showed that the main significant effects for muscle pain had a delayed onset. Further analyses showed that muscle soreness was lower in the massage groups compared to the group that had massage treatment and underwent a cold water immersion treatment or alternate cold water jets.

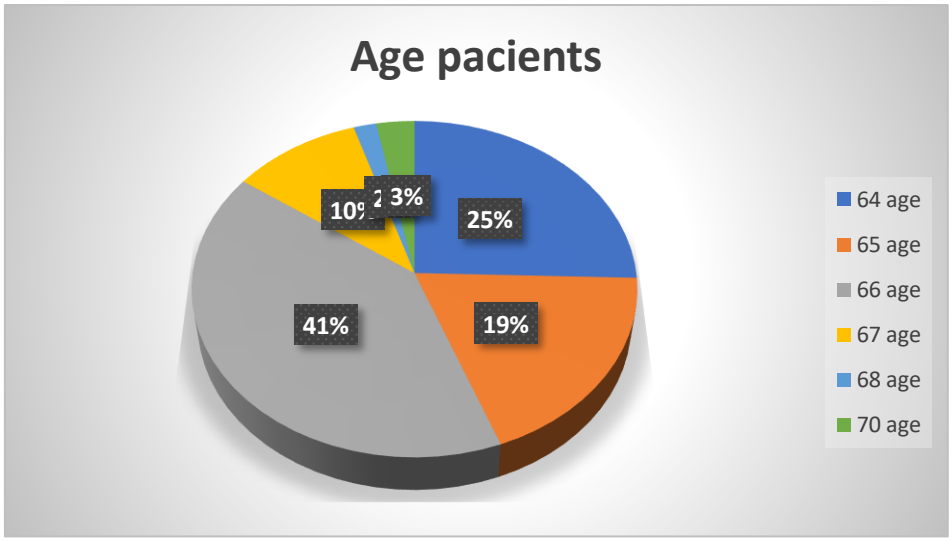
Table 2.

Key features for study participants.

Variables	**Group I (n = 110) Medium ± SD**	**Group II (n = 55) Medium ± SD**
Age (y)	68.2 ± 4	67.6 ± 4
Body mass (kg)	79.8 ± 6.1	79.5 ± 5.3
Height (m)	1.68 ± 0.05	1.68 ± 0.05
Body mass index (kg m−2)	27.8 ± 2.0	28.1 ± 1.6
Perceived valuation	13.9 ± 1.3	13.9 ± 1.3

Figure 2.

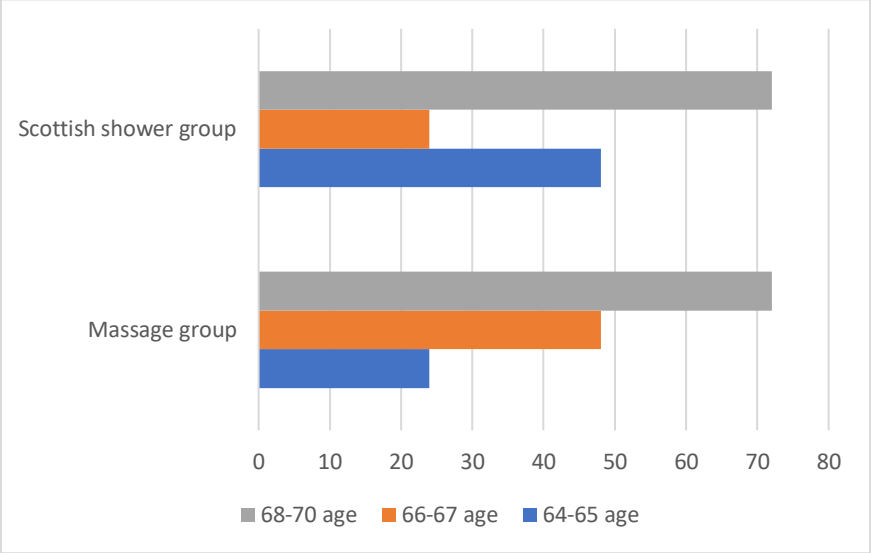
Gender distribution of elderly adult patients



The comparisons showed that the average score was higher in massage recovery group I compared to group II with massage and cold shower at 48 hours. At 24 hours, this difference was significant only in the massage group.

Figure 3

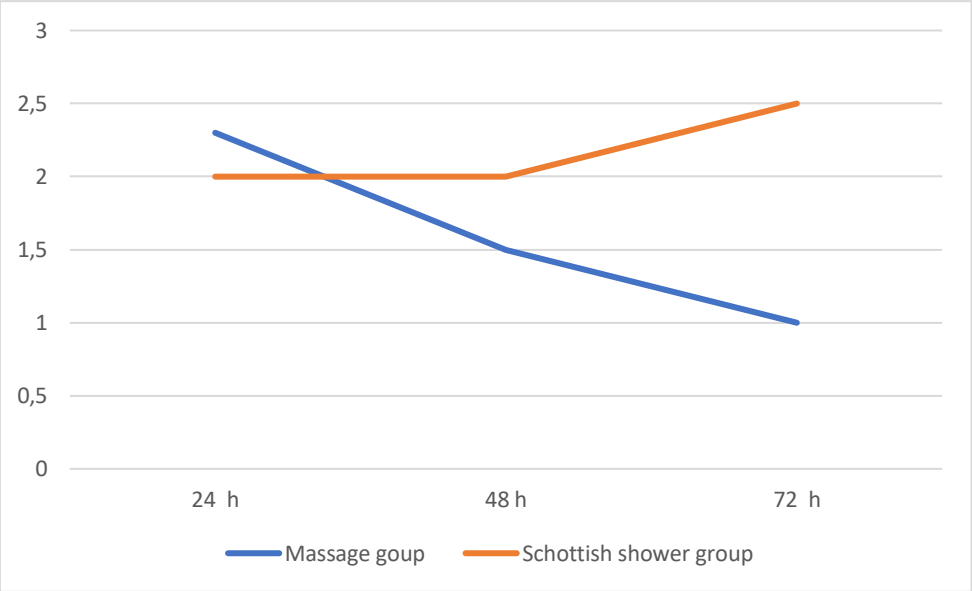
Representation of study groups and age during recovery of included patients.



Comparisons after recovery showed that muscle strength was lower in group II than in massage group I 48 hours after exercise, and at 72 hours group II complained of muscle soreness compared to the other group in the study.

Figure 4.

Representation of muscle pain by study groups at the 3 observed durations.



The study found that repeated massage helped reduce muscle soreness, improve proprioception, regain muscle strength, and relieve balance disorders in older adults. Despite the popularity of massage for post-exercise recovery, the evidence supporting its use is quite limited. In support of our findings, other studies have shown that post-exercise massage improves perceived recovery, reduces pain, and improves the physical and mental well-being of elderly adult patients.

Disscusions

The results obtained in this study show that massage applied repeatedly has beneficial effects on muscle recovery in older adults. Among the benefits observed are the reduction of muscle pain, improved sense of joint position, increased muscle strength and better postural stability. These effects are essential in preventing the risk of falling in this age group.

One of the possible explanations for the effectiveness of massage lies in its ability to stimulate local circulation and reduce muscle tension, which helps to reduce inflammation and muscle discomfort felt after intense physical exertion. In addition, muscle relaxation promotes better activation of proprioceptive receptors, which can lead to a more accurate perception of joint position and better coordination of movements.

Massage can also support the muscle regeneration process by positively influencing connective tissue and muscle elasticity, aspects that can support subsequent physical and motor performance. In contrast, interventions based on cold showers, although they had a moderate effect in reducing pain, did not demonstrate the same benefits in terms of recovery of strength, balance and proprioception.

It is important to note that the success of recovery interventions can be influenced not only by the nature of the techniques applied, but also by their frequency and duration, as well as by the individual reaction of each participant. Thus, the positive results obtained in the group that received only massage can be correlated with the consistency of its application and with the high degree of tolerability and acceptance by the participants.

In conclusion, regular massage, applied after strength training, can be an effective and accessible method of recovery for older adults, helping to reduce post-exercise discomfort and improve motor skills essential for maintaining functional independence.

Conclusions

The results of the study indicate that massage is an effective method of recovery after intense physical exertion in older adults. Applied repeatedly, it helps to reduce muscle pain, supports the restoration of muscle strength and promotes better postural stability. Thus, massage can play an important role in reducing the risk of falls, by improving essential factors such as balance and sense of joint position.

In contrast, interventions based on cold showers showed limited effects, mainly in terms of reducing discomfort, without generating significant improvements in functional parameters such as strength or balance.

Based on these findings, it can be recommended to integrate massage as a strategy to support physical recovery in training programs for active seniors or in the rehabilitation of older people at risk of falling. It is important that such interventions are tailored individually, taking into account the overall health, exercise tolerance and specific needs of each participant.

Limitations

This study, although it provides relevant results on the effectiveness of massage in the recovery of older adults after intense exercise, has some limitations that must be taken into account. First, although participants reported that they did not use supplements or medications during the study period, they did not objectively monitor their eating habits or consumption of substances with a potential effect on recovery, which could have influenced the results.

A placebo group was also not included, making it difficult to differentiate the physiological effects of massage from psychological influences. It is possible that part of the benefits reported by participants are related to the positive expectations associated with massage therapy, known for its strong placebo effect in the context of pain and well-being.

Another limitation is related to the fact that the study was carried out in a controlled setting, which may not fully reflect the real living conditions of the elderly. Individual differences in previous physical activity level, pain sensitivity or muscle stress response were also not taken into account.

To reinforce these results, future research should include closer monitoring of external variables (diet, lifestyle), as well as a placebo group to more clearly isolate the therapeutic effects of the interventions analyzed.

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Pilot Study In Calcified Tendinopathy Of The Shoulder: The Importance Of Targeted Ultrasound-Guided Shock Wave Treatment

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Abstract

Calcific tendinopathy of the shoulder is a degenerative disorder marked by calcium accumulation within the rotator cuff tendons, most commonly involving the supraspinatus tendon. This condition is a frequent source of persistent shoulder pain and reduced function, with reported prevalence among symptomatic individuals ranging from 2.5% to 54% (Uhthoff, Sarkar, & Maynard, 1976). A variety of non-surgical treatments are available, including nonsteroidal anti-inflammatory drugs (NSAIDs), physical therapy, corticosteroid injections, and, in resistant cases, surgery. Recently, extracorporeal shock wave therapy (ESWT) has gained attention as a promising non-invasive treatment option (Brindisino, Marruganti, Lorusso, Cavaggion, & Ristori, 2024). This randomized, controlled, prospective study aimed to be a pilot study in assessing the therapeutic effectiveness of r-ESWT in managing calcific tendinopathy of the shoulder. Two ESWT techniques were compared: one guided by ultrasound to target calcific deposits directly, and the other based on anatomical landmarks focusing on the supraspinatus tendon origin.

Materials and Methods: The study included twenty-one patients diagnosed with calcific tendinopathy, randomly divided into two treatment groups. Each participant received three ESWT sessions, with 2000 pulses delivered at 2.2 bars pressure, using an energy level of 5 and frequency of 8Hz. Clinical progress was evaluated using the Constant-Murley Shoulder Outcome Score (CMS) at 12 weeks and six months following treatment. Additionally, ultrasound imaging was used to monitor changes in the calcium deposits.

Results: Patients treated with ultrasound-guided ESWT showed better clinical and imaging results than those who received the landmark-based treatment. The ultrasound-guided group experienced greater pain reduction and functional improvement, along with a significantly higher rate of complete resolution of calcific deposits.

Conclusions: These results highlight the critical role of accurate targeting in maximizing the effectiveness of r-ESWT for shoulder calcific tendinopathy (Haake, Deike, Thon, & Schmitt, 2002).

Keywords: calcific tendinopathy, supraspinatus tendon, shockwave therapy, ultrasound guidance, Constant-Murley Score

Introduction

Calcific tendinopathy of the rotator cuff is a prevalent cause of persistent shoulder pain, functional limitation impacting daily activities and overall quality of life. The condition is defined by the deposition of hydroxyapatite crystals within the rotator cuff tendons, with the supraspinatus tendon being the most frequently affected (Loew, Daecke, Kusnierczak, Rahmanzadeh, & Ewerbeck, 1999), frequently linked to chronic degenerative processes and metabolic influences (Uhthoff, Sarkar, & Maynard, 1976).

Initial treatment typically involves conservative approaches such as NSAIDs, physical therapy, and subacromial corticosteroid injections, which mainly offer symptom relief without addressing the calcium buildup itself (Mouzopoulos, Stamatakos, Mouzopoulos, & Tzurbakis, 2007). For patients unresponsive to these measures, surgical interventions like arthroscopic calcium removal or needle aspiration may be considered (Loew & Jurgowski, 1993). Nonetheless, extracorporeal shock wave therapy (ESWT) has recently gained recognition as a promising, non-invasive therapeutic option. ESWT is thought to work by stimulating local metabolic activity, encouraging the formation of new blood vessels, and promoting calcium resorption through mechanical fragmentation (Wang, Yang, & Wang, 2003).

Reported radiologic resolution rates of calcium deposits following ESWT range from 47% to 77% (Uhthoff, Sarkar, & Maynard, 1976; Rompe, Rumler, Hopf, Nafe, & Heine, 1995). This pilot study was designed to evaluate and compare the outcomes of two ESWT application methods: one utilizing ultrasound to directly target the calcific lesions, and the other employing anatomical landmarks as a guide. The central hypothesis was that ultrasound-guided ESWT would yield superior results in terms of pain reduction, functional recovery, and calcium deposit dissolution.

Materials and Methods

Study Design

A prospective, randomized controlled study was conducted to evaluate the impact of radial extracorporeal shock wave therapy (r-ESWT) on patients diagnosed with calcific tendinopathy of the shoulder.

The study enrolled twenty-one patients with ultrasound-confirmed calcific tendinopathy of the shoulder, with imaging performed no more than two weeks prior to inclusion. Participants were recruited from the Outpatient Physical Rehabilitation Center in Arad, Romania, between June 2023 and March 2024.

The research followed the International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use – Good Clinical Practice (ICH-GCP) guidelines and received approval from the Local Ethics Committee. All participants provided written informed consent and were screened for eligibility before randomization.

Inclusion and Exclusion criteria are shown in Table 1:

Table 1.

List of Inclusion and Exclusion criteria

Inclusion criteria:
Adults aged 18 years or older
Confirmed diagnosis of calcific tendinopathy through ultrasound imaging
Preserved shoulder mobility, defined as either full range of motion or a minimum of 90° abduction with unrestricted rotational movement
Ongoing symptoms for a minimum of six months, unresponsive to conservative therapies such as NSAIDs, physiotherapy, or subacromial corticosteroid injections
Exclusion criteria:
Rotator cuff tears.
Glenohumeral arthritis or instability.
Neurological disorders affecting the shoulder.
Pregnancy or contraindications to shock wave therapy.
Previous ESWT or surgical intervention.

Clinical Evaluation

Demographic data, including age and gender, were collected for each participant.

The Constant-Murley Score (CMS) was used to assess shoulder function by evaluating pain, range of motion, strength, and the ability to perform daily activities. Assessments were carried out at the start of the study, at 12 weeks, and again at six months after treatment.

The CMS consists of four components: pain (up to 15 points), activities of daily living (up to 20 points), strength (up to 25 points), and range of motion, which includes forward elevation, external rotation, abduction, and internal rotation of the shoulder (up to 40 points) (Ziegler et al., 2019). Higher scores reflect better shoulder functionality. The CMS is interpreted as follows: (Hirschmann, Wind, et al., 2010).

0-55 points=poor

- 56-70 points=fair
- 71-85 points=good
- 86-100 points= excellent

Ultrasound imaging was used at baseline to determine the size and location of the calcium deposits (Gschwend, Scherer, & Lohr, 1989). Follow-up evaluations were conducted at 12 weeks and six months post-treatment, including both a shoulder ultrasound to reassess the size of the calcific deposits and a functional assessment using the 100-point Constant-Murley Score (CMS), performed by the same evaluator throughout the study.

Randomization and Intervention

The enrolled patients were randomly divided into two study groups using random permutated blocks by an independent observer, not involved in the treatment delivery:

- Group 1: Received ESWT targeted on the calcific deposit under ultrasound guidance.
- Group 2: Received ESWT applied at the supraspinatus tendon origin using simply anatomical landmarks.

Each participant received three r-ESWT treatment sessions spaced one week apart (Uhthoff, Sarkar, & Maynard, 1976), with each session delivering 2000 shock wave impulses at an intensity of 2.2 bars, energy level 5, and a frequency of 8 Hz. Treatments were administered using the Storz (Chattanooga) Intelect RPW Lite shock wave device.

Statistical Analysis

Data analysis was performed using SPSS version 10.0 (Statistical Package for the Social Sciences, SPSS Inc., Chicago, IL). An independent samples t-test was used to compare outcomes between the two groups, with statistical significance defined as $p < 0.05$. Before applying for the t-test, the Kolmogorov-Smirnov test was conducted to verify the normality of

the data distribution and confirm variance homogeneity. All experimental results are reported as mean values ± standard deviations (SD).

Results

From June 2023 to March 2024, a total of 21 patients were enrolled in the study. The gender distribution was balanced across both groups, with a mean age of 54 years (ranging from 41 to 68 years). Of the participants, thirteen were female and eight were male.

All patients had a confirmed diagnosis of calcific tendinopathy of the shoulder and were treated using the Storz (Chattanooga) Intelect RPW Lite shock wave device.

The first group (n = 11) underwent three treatment sessions, each delivering 2000 impulses at 2.2 bars (energy intensity level 5, frequency 8 Hz), with the shock waves precisely targeted to the calcific deposits under ultrasound guidance. The second group (n = 10) received an identical treatment protocol, but the shock waves were applied to the anatomical origin of the supraspinatus tendon.

Patient progression through the study is illustrated in the flow diagram in Figure 1.

Figure 1.

Patient progression through the study

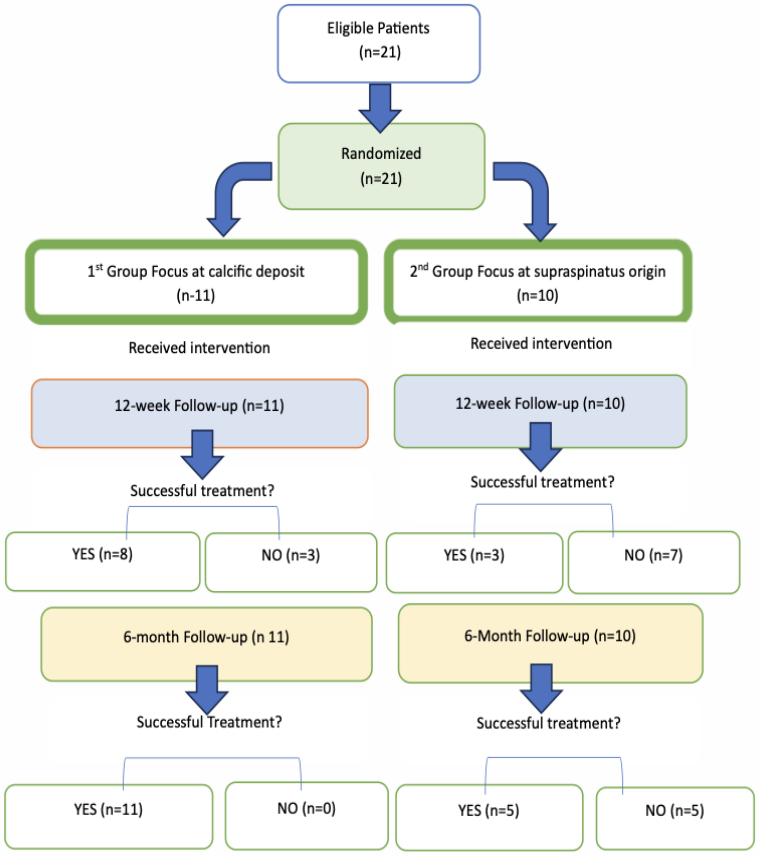

Table 2.

Displays the numerical results of the study as a comparison between the two-study groups.

Group/ Parameter	Focus on Deposits (Calcific Deposit Group)	Focus on Supraspinatus tendon (Landmark-Based Group)	95% Confidence Interval (group difference)	Student's test significant
Constant and Murley score (age corrected)				
Before intervention	46,6±10,5(n=11)	41,7±11,2(n=10)	-3,1 to 7,8	No
12 weeks	92,4±18,7(n=11)	72,6±21,3n=10)	9,6 to 30,3	Yes
6month	95,1±16,3 (n=11)	80,5±20,1 n=10)	10,8 to 27,2	Yes
Number of successful treatments				
12 weeks	8 (n=11)	3(n=10)	n/a	n/a
6month	11(n=11)	5(n=10)	n/a	n/a
Subjective improvement (%)				
12 weeks	72,72±27,1 (n=11)	30±29,4 (n=10)	10,6 to 45,31	Yes
6month	90,9±16,3 (n=11)	50±20,1 (n=10)	12,8 to 29,9	Yes

An increase of function and a reduction of pain occurred in both groups. Statistical analyses showed a significant superiority of extracorporeal shock wave application at the calcified area using ultrasound guidance, based on the Constant-Murley score both at 12 weeks and 6 months compared to Baseline.

Pain and functional improvement were observed in both groups, but the ultrasound-guided ESWT group demonstrated significantly superior results:

Table 3.

Overall CMS at 6-month post Extracorporeal Shockwave Therapy (ESWT)

Group 1 (Focus on Calcific deposit – Targeted Ultrasound-Guided ESWT):
63.6% Excellent (7/11)
27.27% Good (3/11)
8.9% Fair (1/11)
Group 2 (Focus on Supraspinatus tendon origin - Anatomical Landmark-Based ESWT):
50% Good (5/10)
30% Fair (3/10)
20% Poor (2/10)

The overall results based on CMS at 6-month post-treatment in the first group were 63,6% excellent (7/11), 27,27% good (3/11), 8,9% fair (1/11) and those of the second group were 50% good (5/10), 30% fair (3/10) and 20% poor (2/10).

The symptom recurrence rate in the first group was 8,9% (1/11) at 12 weeks and remained unchanged at 6month follow-up.

No significant side effects were seen during the treatment in either of the study groups.

Table 4.

Two-by-Two cross table for complete resorption of the calcific deposit 6 month after Extracorporeal Shock Wave Therapy

Group	***Complete Resorption***	***Partial Resorption***	***No Resorption***	***Number***
CD group*	*4*	*4*	*3*	*11*
TM group**	*0*	*4*	*6*	*10*
Number	*4*	*8*	*9*	*21*

Note: *CD group - focus of shock waves at calcific deposit; **TM group - focus of shock waves at tuberculum majus

Calcium deposit resorption was significantly greater in Group 1 (13). In this group, complete resorption occurred in 36.4% of patients (4 out of 11), partial resorption in another

36.4% (4 out of 11), and no change was observed in 27.3% (3 out of 11). In contrast, Group 2 showed partial resorption or fragmentation in 40% of cases (4 out of 10), while the remaining 60% (6 out of 10) exhibited no change in deposit size.

Disscusions

These findings highlight the value of accurate targeting in the application of extracorporeal shock wave therapy for calcific tendinopathy. Utilizing ultrasound guidance allows for more precise localization of the calcific deposits, which contributes to improved treatment effectiveness and faster relief of symptoms (Xue et al., 2024). Previous studies have similarly shown that focused ESWT not only enhances short-term outcomes but also lowers recurrence rates and supports sustained functional improvement.

Clinical Implications:

- ESWT is safe and effective for calcific tendinopathy treatment.
- Ultrasound guidance ensures optimal results by precisely targeting the calcific deposits.
- The risk of symptom recurrence is lower when ESWT is guided accurately.

This study has several limitations, particularly the lack of a control group and the relatively small sample size. Psychological factors, including both general and pain-related distress such as fear-avoidance beliefs, catastrophizing, low self-efficacy, work-related stress, depression, and anxiety, can significantly influence disability, quality of life, and treatment outcomes in individuals with musculoskeletal conditions. These effects are often more pronounced in female patients.

It is important to identify and consider these psychological aspects, often referred to as "yellow flags," to interpret Patient-Reported Outcome Measures (PROMs) more accurately, prevent the development of chronic pain, and create more effective and individualized treatment plans.

Therefore, the results of this analysis should be considered preliminary. Further studies with larger sample sizes are needed to confirm the statistical patterns and relationships observed in this research.

Conclusions

Extracorporeal shock wave therapy represents an effective, non-invasive option for treating calcific tendinopathy of the shoulder. The findings of this study indicate that targeting the calcific deposits with ESWT under ultrasound guidance leads to greater improvements in pain relief, shoulder function, and calcium deposit resorption compared to treatments guided solely by anatomical landmarks. These results support the routine use of ultrasound guidance to enhance treatment precision and effectiveness.

Clinical Recommendation: When administering ESWT for calcific tendinopathy, targeted ultrasound-guided application should be considered a valuable method to optimize therapeutic outcomes.

Limitations

As this is a pilot study, one of its main limitations is the small number of participants. Future research will aim to include a larger patient cohort to strengthen the findings and validate the statistical trends observed.

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The Effectiveness Of Kinesiotherapy In Managing The Risk Of Muscle Injuries In Bodybuilders

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Abstract

Bodybuilding, as a sports discipline, involves a rigorous training regimen primarily focused on developing muscle hypertrophy and maximal strength. Practiced at both recreational and competitive levels, bodybuilding entails systematic and progressive loading of the musculoskeletal system, resulting in significant biomechanical stress on muscle groups, joints, and myofibrillar units involved (Zemper, 2005). Repeated stress, particularly in the absence of appropriate recovery strategies, increases susceptibility to muscle injuries, which can range from mild muscle strains to partial or complete muscle fiber tears (Orchard & Best, 2002).
Muscle injuries not only affect immediate athletic performance but can also significantly impact the continuity of training, functional balance, and, in severe cases, compromise the athlete's long-term ability to compete at a high level (Järvinen et al., 2005). Consequently, preventing these dysfunctions has become a strategic priority in modern sports performance management (Ekstrand et al., 2011).

Keywords: kinesiotherapy, bodybuilding, muscle injuries, injury prevention, rehabilitation

Introduction

Kinesiotherapy, a core component of rehabilitation sciences, is a therapeutic intervention that utilizes controlled movement and targeted exercise to restore and optimize bodily function (Kisner & Colby, 2012). In the context of bodybuilding, kinesiotherapy emerges as a vital resource, not only in post-injury recovery but also as a proactive tool for injury prevention (Andrade et al., 2010). Through personalized interventions based on detailed functional assessments, kinesiotherapists can identify muscle imbalances, mobility deficits, or motor control impairments that may predispose athletes to injuries (Myer et al., 2006).

Therapeutic exercise programs aim to enhance muscle flexibility, restore agonist-antagonist balance, and strengthen the kinetic chains involved in strength training movements (Page et al., 2010). Additionally, kinesiotherapy significantly contributes to the development of proprioception and stability in major joints (shoulders, knees, hips), thereby reducing the risk of dysfunctional compensations and repetitive trauma (Lephart et al., 1998).

In this context, the purpose of this study is to evaluate the effectiveness of a kinesiotherapy program specifically designed for bodybuilding athletes. The study aims to compare the effects of this program on the risk of muscle injuries in two distinct groups: an experimental group, which benefits from integrated kinesiotherapeutic intervention, and a control group, which continues training per their usual routine without additional functional recovery interventions (Brukner & Khan, 2012). Through a comparative analysis of injury frequency, recovery time, and functional progress, the study seeks to highlight the importance of incorporating kinesiotherapy into the physical training plans of high-performance bodybuilders.

Materials and Methods

Participants

- The study included 60 bodybuilders, aged between 20 and 45 years, divided into two groups:
- Experimental Group (n=27): Participants who followed a personalized kinesiotherapy program.
- Control Group (n=33): Participants who continued their usual training without kinesiotherapeutic intervention.

Inclusion Criteria

To ensure the internal validity of the study and the homogeneity of the investigated sample, strict inclusion criteria were applied. Selection was based on clinical, functional, and ethical considerations to minimize the influence of external variables and to clearly highlight the effects of kinesiotherapeutic intervention on the risk of muscle injuries.

Active Bodybuilding Practitioners for at Least 2 Years

Selected participants had a minimum of two years of experience in practicing bodybuilding at an amateur level. This condition ensured that subjects had undergone a phase of neuromuscular adaptation specific to strength training and were familiar with exercise execution techniques, training regimens, and the general structure of a muscle development program. This criterion guaranteed a comparable level of preparation, reducing variability due to lack of experience or inadequate athletic training.

No Major Surgical Interventions in the Last 12 Months

Another essential eligibility criterion was the absence of major surgical interventions (e.g., arthroscopies, ligament reconstructions, joint replacements) in the year prior to inclusion in the study. This condition aimed to exclude cases where postoperative recovery might have negatively influenced biomechanical parameters, muscle strength, joint mobility, or the risk of recurrence. It also allowed for an unbiased evaluation of the kinesiotherapy program's effects on a functional locomotor system without recent major trauma.

Signed Informed Consent

All participants were thoroughly informed about the study's purpose, the structure of the intervention program, potential risks, and possible benefits. Subsequently, each participant signed an informed consent form in accordance with the requirements of the organizing institution's Ethics Committee. This process complied with the provisions of the Declaration of Helsinki and the standards of good practice in biomedical research. Ensuring informed

consent was not only an ethical obligation but also a guarantee of the participants' voluntary and conscious collaboration throughout the study.

Kinesiotherapy Program

The kinesiotherapy program implemented in this study was designed to prevent muscle injuries by optimizing the functional parameters of the locomotor system. The therapeutic intervention spanned 12 months and was structured progressively, tailored to the needs and training level of each participant in the experimental group.

The program integrated the following components:

Initial Functional Assessment

Prior to the commencement of the program, all participants underwent a standardized functional evaluation. This assessment encompassed tests for:

- Muscle flexibility (utilizing protocols such as Sit and Reach, Thomas Test, etc.),
- Joint mobility (assessed via goniometry at major joint levels),
- Muscle balance (evaluated through agonist-antagonist ratios using electromyographic and manual methods),
- Motor control and postural stability (assessed via tests such as the Y-Balance Test, Flamingo Balance Test, etc.).

The objective of this evaluation was to identify imbalances, asymmetries, and neuromuscular dysfunctions that may constitute risk factors for injury development.

Weekly Postural Correction Sessions

Participants engaged in weekly specialized postural reeducation sessions, supervised by a kinesiotherapist. These sessions incorporated exercises targeting:

- Biomechanical alignment of body segments,
- Body awareness through visual and tactile feedback,
- Strengthening of postural chains via isometric and isotonic exercises with progressive resistance.

The goal was to achieve global postural rebalancing and mitigate chronic tension in antigravitational musculature.

Daily Flexibility and Active Stretching Exercises

The program included a daily protocol of active stretching exercises, with emphasis on muscle groups repeatedly stressed in bodybuilding (pectorals, hamstrings, quadriceps, hip flexors, gastrocnemius). Dynamic active stretching was applied during the warm-up phase,

while static stretching was implemented post-training. The total daily duration allocated to this component was approximately 15–20 minutes.

Neuromuscular Activation Techniques

To enhance motor control and selective muscle reactivation, the following techniques were employed:

- Proprioceptive Neuromuscular Facilitation (PNF) techniques (contract-relax, hold-relax),
- Exercises targeting synergistic muscle chain activation (e.g., gluteals and scapular girdle),
- Guided multiplanar functional mobilizations.

These techniques aimed to reeducate motor patterns and prevent dysfunctional compensations during strength training.

Stabilization and Muscle Balance Programs

Participants underwent twice-weekly dynamic stabilization sessions, featuring exercises on unstable surfaces (e.g., Bosu, balance boards, proprioceptive balls). The focus was on activating core musculature, stabilizing the pelvic and scapular girdles, and enhancing intersegmental coordination within closed kinetic chains. These interventions were critical for maintaining neuromuscular control under load and preventing compensatory instabilities.

Progress Monitoring via Monthly Assessments and Personalized Training/Recovery Logs

Each participant received monthly functional reevaluations, with program adjustments based on the evolution of motor indicators. Concurrently, athletes maintained personalized logs documenting daily parameters (exercise types, perceived pain, difficulty, general condition). These data were utilized by the research team to assess program compliance and the progressive efficacy of the intervention.

Participants in the experimental group benefited from a tailored kinesiotherapy program, structured based on initial functional assessment outcomes. The program was implemented over 12 months, concurrently with standard bodybuilding training, with careful adjustments to workload and volume to facilitate effective integration of therapeutic interventions.

Each participant underwent monthly evaluations in the presence of a multidisciplinary team (kinesiotherapist, personal trainer, sports physician), using a standardized set of tests targeting the following functional parameters:

- Muscle flexibility assessed via Sit and Reach tests, posterior chain extension, and specific tests for predominantly stressed muscle chains (hamstrings, quadriceps, pectorals);
- Static and dynamic balance evaluated through functional tests such as the Y-Balance Test and Flamingo Balance Test;
- Neuromuscular control analyzed via qualitative observation of movement during exercises like squats, lunges, and light-load lifts, alongside postural control in unstable positions.

Based on these results, interventions were adjusted monthly according to progress levels, emergence of potential dysfunctions, or participant feedback. Adjustments involved modifying exercise intensity, introducing novel neuromuscular stimuli, or extending active recovery phases. This individualized and adaptive approach ensured program adherence, minimized overexertion, and optimized functional outcomes.

According to participant logs, monitored by specialists, compliance with the program was high (over 90% of scheduled sessions were fully completed), significantly contributing to the validity of the results obtained.

Results and Discussions

To objectively assess the impact of the kinesiotherapy program on the risk of muscle injuries, data on injury incidence in the two groups (experimental and control) were compiled and compared over the 12-month period.

Table 1.

Incidence of Muscle Injuries in the Two Groups (Reported Monthly)

Month	Experimental Group (n = 27)	Control Group (n = 33)
1	1	4
3	2	6
6	1	5
9	1	7
12	0	6

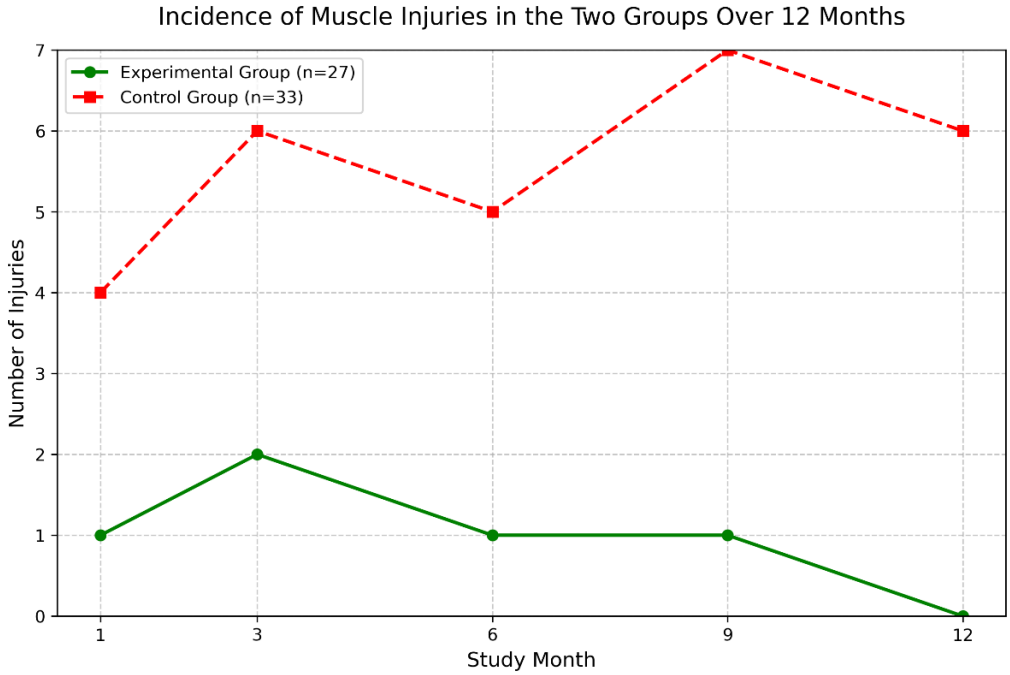
Interpretation

Throughout the study duration, the experimental group recorded a total of 5 muscle injuries, whereas the control group reported 28 cases. The differences became significant from the third month onward, becoming particularly evident in months 9 and 12, during which the experimental group maintained a consistently low injury rate, culminating in zero injuries in the final month of the study. In contrast, the control group exhibited an upward trend in incidence, peaking at 7 cases in the ninth month.

These findings support the hypothesis that personalized kinesiotherapeutic interventions actively contribute to reducing the risk of muscle injuries among bodybuilders by enhancing motor control capacity, functional balance, and muscle resilience to repeated stress.

Figure 1

Graphical Representation of Muscle Injury Incidence



Data analysis was conducted using the IBM SPSS Statistics software package, version 26. To address the research objectives and test the formulated hypotheses, several statistical tests appropriate to the data type and study design were applied.

To compare the mean number of injuries between the two groups (experimental and control), an independent samples t-test was employed, assuming normal data distribution and homogeneous variances. The results revealed a statistically significant difference between the groups in terms of injury frequency, with a significance level of $p < 0.01$, indicating the effectiveness of the intervention applied in the experimental group.

To examine the temporal evolution of key variables (e.g., injury frequency or functionality level), a repeated-measures ANOVA was utilized, a method that enables the comparison of a variable's values measured at multiple time points. This analysis confirmed the presence of significant temporal variations, particularly within the experimental group, suggesting a cumulative effect of the applied intervention.

Frequency distributions for categorical variables (e.g., injury type, participant gender) were compared using the Chi-square test to identify significant differences between groups. In some instances, the test indicated a statistically significant association between participation in the kinesiotherapy program and the type of reported injuries.

To evaluate the relationship between adherence to the kinesiotherapy program and the outcomes achieved (injury reduction, increased functionality), the Pearson correlation coefficient was calculated. The analysis revealed a significant negative correlation between

program adherence and injury incidence ($r = -0.68$, $p < 0.01$), suggesting that greater adherence to the program is associated with a lower risk of injuries.

Overall, the statistical results support the effectiveness of the implemented intervention program and underscore the importance of consistent adherence to therapeutic recommendations in reducing injury risk.

In the experimental group, the total incidence of injuries was 5 cases over the 12-month period. In contrast, the control group recorded 28 muscle injuries. The differences were particularly notable in months 9–12, during which the experimental group reported no injuries, while the control group recorded 13 cases.

- The average recovery duration was:
- Experimental Group: 4.2 days ± 1.1
- Control Group: 9.6 days ± 2.4
- Participants in the experimental group demonstrated a 35% improvement in scores on functional tests (Y-Balance stability test, joint mobility test, and postural control test).

Initial and final scores on motor control and stability tests indicated greater progress in the experimental group:

- Y-Balance Test (average):
    - Initial: 84 cm → Final: 112 cm (experimental group)
    - Initial: 87 cm → Final: 92 cm (control group)

Conclusions

The results of this study support the effectiveness of kinesiotherapy in reducing the risk of muscle injuries among bodybuilders. Therapeutic exercise programs demonstrated a positive impact on injury prevention, reduction of recovery time, and improvement of neuromuscular control (Sherry & Best, 2004; Hewett et al., 2005). Through targeted interventions, kinesiotherapy contributes to the identification and correction of muscle imbalances, optimization of exercise execution techniques, and enhancement of body awareness (Page et al., 2010).

The specialized literature corroborates these findings, highlighting the importance of active mobilization and functional muscle strengthening in injury prevention (Croisier et al., 2008; Waddington & Adams, 2003).

A significant observation in the experimental group was the increased psychological motivation. The progress log and continuous feedback from the kinesiotherapist reinforced participants' commitment to the program (Andrade et al., 2010). The adaptability of the intervention and the personalized attention provided to each participant significantly contributed to the program's effectiveness (Brukner & Khan, 2012).

Study limitations include the relatively small number of participants, the lack of complete randomization, and the absence of post-study follow-up. It is recommended that future research be expanded through multicenter, randomized studies with longitudinal monitoring (Järvinen et al., 2005).

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The Importance Of Selection And The Influence Of An Assisted Training Program On The Development Of Motor Skills In Children A Comparative Study

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Abstract

The multiple aspects related to the importance of selection in the sports field are one of the fundamental requirements and, at the same time, the premises for successful results in the long term. The objectives of this study were to achieve a rigorous selection, adapted to the specifics of athletic events, considering a variety of parameters that, integrated, outline the general sports profile of the children included in the research.

The methods used included the initial and final testing of the students remaining in the study group, in order to obtain a more objective and precise assessment of the individual motor skills. Before deciding on the inclusion of children in the specialized training process, it is recommended that they follow a unitary basic training program, lasting between 1 and 3 months, to balance the initial level of motor development.

The results obtained highlight significant differences between the two analysed groups. The final mean values support the hypothesis that the students in group A (experimental), who benefited from an additional assisted sports training program, structured according to a SWOT analysis, obtained superior results compared to the control group. This demonstrates the

effectiveness of the proposed intervention and the relevance of a well-founded selection, followed by a period of preparation adapted to the specific needs of each child.

Keywords: sports performance, athletics, effort, motor skills, rigorous selection

Introduction

The age for starting the optimal training of children and juniors for practicing performance sports depends mainly on the specifics of each branch of sport, namely on the degree and directions of request of the body for this specificity (Bompa & Haff, 2009; Malina, Bouchard, & Bar-Or, 2004). In all branches of sports there is today a tendency to decrease the age at which the selection and the start of the training activity should be made (Rowland, 2005). Based on the data provided by the literature, the optimal age for primary selection and the beginning of practical training in athletics is 9–10 years (Vaeyens et al., 2008). The particularities of motor selection are determined by the age at which the selection is made (Williams & Reilly, 2000).

From a psychological point of view, the age of 9–10 years falls into the early school period (from 6 to 10–11 years), called the third childhood and the beginning of puberty and adolescence (10–14 years) (Schiopu & Verza, 1981; Papalia, Olds, & Feldman, 2009). This period between the child's entry into school and the end of the elementary cycle is described as a kind of end of childhood with age particularities similar to preschool ones, either as the primary onset stage of adolescence or, finally, as a distinct stage of childhood (Eccles, 1999).

The general psychic development during the early school period presents important characteristics and advances in development because the learning process becomes conscious (Erikson, 1963; Piaget, 1972). Learning becomes the fundamental type of activity (Vygotsky, 1978). During the period of the third childhood, the psychic transformations are made in an apparently slow, unspectacular way (Inhelder & Piaget, 1958). The direct effects of mental development are seconded by numerous indirect effects of school life (Bronfenbrenner, 1979). The school offers knowledge and skills the child could not acquire on their own and organizes peer interactions in a competitive and structured environment (Slavin, 2006).

The development of permanent dentition and intensification of calcium metabolism, as well as ossification in the chest, clavicles, spine, and pelvis, reflect key somatic transformations (Malina et al., 2004; Beunen & Malina, 1996). The strengthening of joints and muscle volume, particularly the fine muscles of the hand, supports improvements in skill and coordination (Payne & Isaacs, 2012). Ambidexterity, as well as a distinction between left- and right-handedness, becomes more defined (Gallagher, 2013).

Mentally, young schoolchildren exhibit a change in general orientation and preferences (Cole & Cole, 2001). Rule-based group games become central, helping children navigate collective dynamics and adapt socially (Harter, 1999; Berk, 2013).

Intellectual development increases markedly between 9–10 years old, characterized by growth in evaluative thinking and critical capacity (Kuhn, 2000). Children gain greater insight into their own and peers' cognitive contributions during lessons (Flavell, 1985). Training improves perceptual capacity, and logical thought becomes more flexible (Case, 1992).

Knowledge expansion and conceptual refinement allow children to discern between real and imaginary more clearly (Siegler, 2006). Creativity emerges, framed by rules and structured concept use, and can flourish in practical activities (Runco, 2004). Fantasy finds structured expression through schoolwork and games (Sawyer, 2012).

Learning capacity intensifies in this phase, with memory evolving into a conscious, fundamental tool (Baddeley, 2000). Repetition solidifies retention and reinforces knowledge (Schunk, 2012). Repeated success boosts confidence and enhances the learning process (Bandura, 1997).

The social environment shapes personality development in two major ways: social interaction and internalization of new roles and norms (Erikson, 1963; Bronfenbrenner, 1979). Family dynamics and school exposure to different lifestyles allow children to compare and reflect on their own background (Eccles & Roeser, 2009).

By age 10, children gain greater self-awareness and acquire the dual identity of student and family member, creating a broader social perspective (Paunescu, 2011). They complete the major cycles of childhood and transition toward adolescence (Papalia et al., 2009).

The athlete's lifestyle, understood as an orderly program of activity and rest, underlies long-term performance (Bompa & Haff, 2009). High performance demands scientific and sustained training, which requires strict adherence to a correct lifestyle (Martens, 2004). Health, fitness, and longevity in sports depend on routine and discipline (Reilly, 2007).

Lifestyle must be individualized, considering sport type, athlete personality, and career phase (Issurin, 2008). Though universal rules exist, adaptation to personal and contextual needs remains key (Weinberg & Gould, 2014).

Materials and Methods

The research was carried out during the 2022-2023 school year on the occasion of the selection for the training of the fifth grade, held at the Vinga Technological High School.

Some initial tests (T.I.) a number of 58 students, with the help of the following tests: 50 meters, long jump without momentum, 600 meters and the Ruffier test, which was chosen to check the body's adaptability to effort.

We performed the recording of somatic and motor data, data processing, statistical and mathematical methods. We used the swot analysis, in order to be able to draw the main conclusions related to the efficiency of the selection, the success of the selection, to see the strengths, weaknesses, opportunities and threats that may arise, the effectiveness of the means used, the need to approach the selection from another perspective.

Following the results obtained, a number of 24 students were retained. Along with the medical visit, we aimed to ensure that the students of the fifth-grade athletics who were selected did not present physical deficiencies, proportional ratio between waist and weight, between body segments, respectively between the trunk and the lower limbs, speech, hearing, vision defects, to have a high level of motor skills specific to athletics.

The 18 students were subjected to anthropometric measurements such as: the length of the lower limbs, the span of the arms, the thoracic circumference, the waist of the future adult, using several estimation methods.

These initial investigations proved average indices known to the good age only the level of knowledge, skills, and poor motor skills.

Following the analysis of the initial tests, the 24 students were divided as follows: the children with the best results in the T.I. (initial testing) will form group A (experimental group), the others making up group B (control group).

Subsequently, out of the 24 students, 6 children withdrew or were eliminated, leaving only 18 students in the study.

At the end of the training period, all students will take the final test (TF) by going through the same sports tests.

During the school year in our study, all students participated in the practical sports training classes (8 hours/week) and group A (experimental) also went through the training program within the additional sports education of three days a week.

The training program used for polyvalent training in supplementary sports education for category I and junior children included three stages:

- Stage A - preparatory period (September - December)
- Stage B - part II of this period (January - March)
- Stage C - the third part of athletic training (April - June)

They must complete and achieve at least 440 points in the eight tests of the general physical training test: 50m, standing length, endurance, sheep, hanging with bent arms or pull-ups, commuting, abdomen in 30 seconds, coxofemoral mobility in the anterior plane.

Speed running - 50 meters –

Is performed with a standing start, timed at the first movement. Shoes with spikes are not used. Two attempts are awarded with breaks between them. The results are recorded in seconds and tenths.

Long jump from the spot - only one pendulum of the arms is allowed for the momentum. Two attempts are given, measured from the tip to the heel. Jumping barefoot or in shoes. The result is recorded in centimeters.

Endurance running

Up to 12 years old both girls and boys run 600 meters, from 12 years old girls 800 meters, and boys 1000 meters. It is run only once. Walking is considered abandonment. The result is recorded in minutes and seconds.

Ruffier Test

It was used to check the body's adaptability to effort. The Ruffier test is one of the most affordable tests with good results for school activity as well. It consists of taking the pulse of a subject in repau, then after performing thirty squats in 45 seconds, immediately after the effort and one minute after the effort. The last measurements are taken for 15 seconds and reported to the minute then they are entered into the following formula:

$$indice\ Ruffier = \frac{P+P1+P2-200}{10}$$

The obtained index is assessed as follows:

1… -5 -excellent

5, 1… -10 -medium

10, 1… -15 -weak

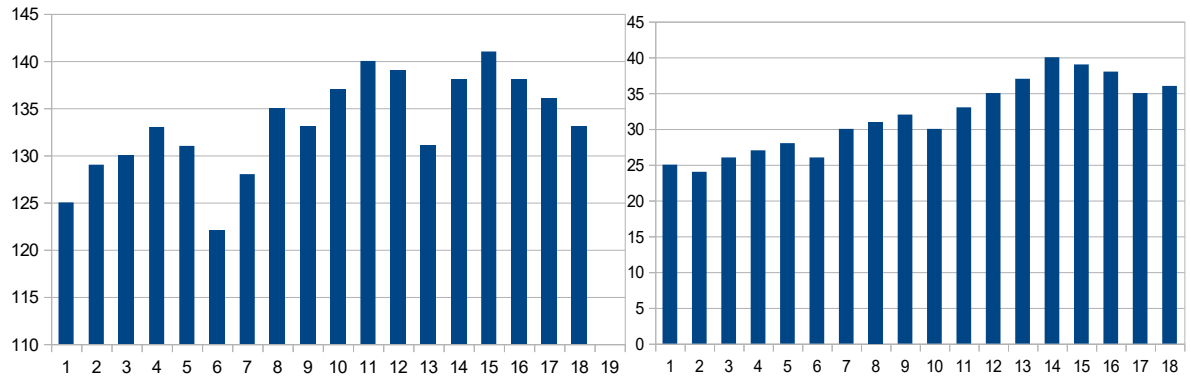
over 15, 1 …-insufficient.

Results

The subjects in the study group had the following parameters: they have a waist between 123 cm and 140 cm, with a body weight between 25 kg and 41 kg, none of the participants had physical deficiencies in the upper limbs, lower limbs or spine, which reflects a harmonious physical development and a general state of health corresponding to their age.

Figure 1.

Graphic representation of the height of pupils/no. students (a) and body weight /no. Students(B)

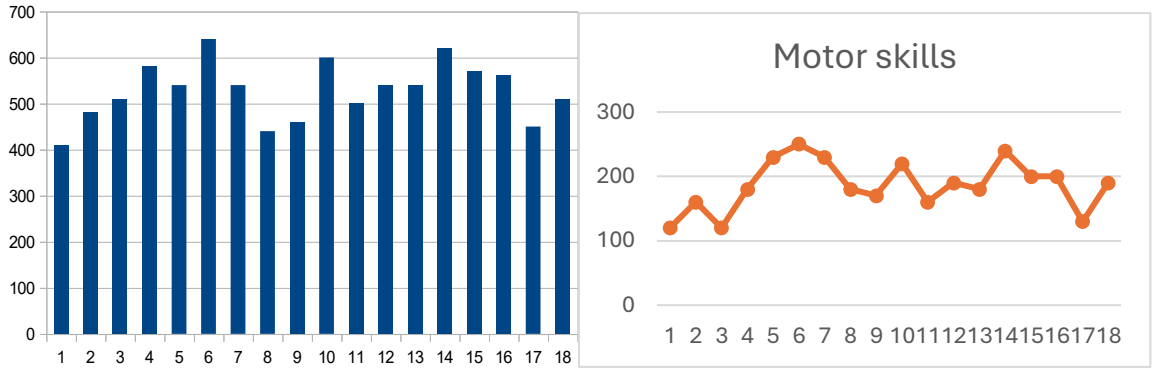


A B

The results obtained from the test had an equivalent in points, adding up the points from each test we obtained a final score. After the motor skills selection tests, 18 children who met the requirements of the scoring system were admitted, after which the level of motor skills specific to athletics was checked.

Figure 2.

Graphic representation of the score at T.I/no. students (a) and motor skills at T.I./no. Students(B)



A B

By summing the individual scores, a final score was determined for each child at the initial test. Following this evaluation stage, a number of 18 children were admitted, as they met the requirements of the adopted scoring system. Subsequently, for these selected children, an additional check was carried out at the final test of the level of motor skills specific to the athletics branch, in order to assess the degree of preparation and potential for this sports discipline.

The results obtained after the final testing of the students in the two groups (A - experimental and B - control) had an equivalent in points, according to the score tables presented, adding the points from each test we obtained a final score.

Table 1.

Results recorded at the level of motor development and the score awarded, group A (experimental);

Arithmetic mean	**216.67**	**236.67**
Standard deviation	22.36	20.77
Coefficient of variability	500.00	431.25

Table 2.

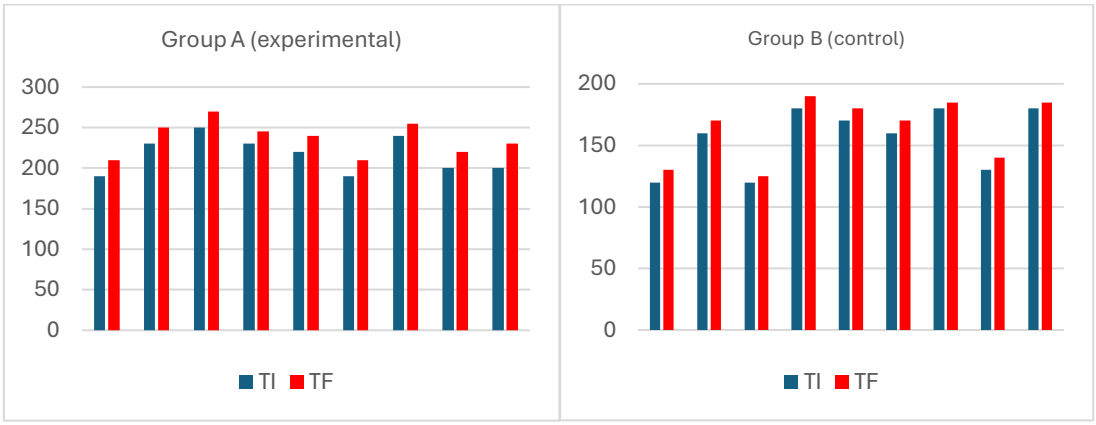
Results recorded at the level of motor development and the score awarded, group B (control)

Arithmetic mean	**155.56**	**163.89**

Standard deviation	25.55	25.34
Coefficient of variability	652.78	642.36

Figure 3

Graphic representation of the score obtained at T.I/T.F/no. students (a) and motor skills at T.I./T.F/no. Students(B)



A B

Following the score obtained at T.I/T.F/no. students and motor skills we can say that in group A (experimental) we have:

- Arithmetic average 236.67 points, with a progress of 9.2% compared to the initial tests
- Standard deviation 20.77 down by approx. 2 points compared to the initial tests
- The coefficient of variability 431.25, decreasing compared to the initial tests, which denotes a uniformity and homogenization of the performances at the level of the group.

And again, in group B (control):

- Arithmetic average 163.89 points, with a progress of 5.3% compared to the initial tests
- Standard deviation 25.34 down from baseline tests
- The coefficient of variability 642.36, decreasing compared to the initial tests.

Conclusions

The data obtained indicate that the intervention applied to the experimental group had a more significant impact on the motor progress and homogenization of the group, compared to the control group. The decrease in the coefficient of variability and the increase in the arithmetic mean in group A reflect an increased efficiency of the implemented program.

After a year of specific training, children must master the basic motor skills, specific to athletics.

In order for the selection process to benefit from chances of success, it is recommended:

- those who make the selection should know very well what kind of qualities and skills the respective sport requires.
- those subject to selection must possess those qualities and aptitudes, in relation to their age, at the highest possible level.
- to know the range of qualities that can be less perfected, usually those genetically programmed, where the initial requirements must also be more severe.

The improvement of qualities is inextricably linked to the maturation of their morphological and functional substrate and psychic development, processes that have their own dynamics, differentiated in relation to age.

Because of this, it is never possible to speak of a single age of selection valid for all sports. For example, the substrate of stable motor qualities matures before the end of puberty, and the logitudinal somatic dimensions, with the end of bodily growth and development, while the substrate of labile motor qualities evolves also in the mature period, being also influenced by the training process.

Selection is accepted as a system that can be divided, in the first instance, into the following main components: sports selection, biomedical selection, psychological selection.

In the future, for a successful selection, a greater propaganda is required in the schools in the county, which can be carried out through the local media, through a selection program developed by the specialized department, the organization of competitions, discussions with physical education teachers in schools, discussions with parents, leaflets and posters distributed in schools.

The selection activity must be a permanent activity; the primary selection is the basis of great sports performance.

An important role in the selection is also played by attracting material and financial funds, through sponsorships, financing projects, in order to motivate and support the children's activity.

The most effective means for selection must be found, which will highlight the children's qualities.

However, the child's talent or genetic potential remains the main source of selection. This involves an ample conceptual and organizational action of evaluation on different levels (anamnesis, diagnosis of health status, level of growth and physical and functional development, mental availability, etc.) of large communities of children and juniors. For the selection to take place, you need a model and a personalized or standardized system. Personally, I opt for the personalized mode because in the degree of selection I use my own opinion.

As in other sports disciplines, the selection process in athletics must meet some conditions.

Selection, by its application, ensures the achievement of high performances; can substantially reduce the duration of training by favoring the application of efforts in accordance with the particularities of the modern concept of training. It also detects capped athletes; it avoids an unnecessary volume of work and material investments that cannot be used and gives the possibility of recruiting young elements, expanding the possibilities of affirmation at international level.

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